

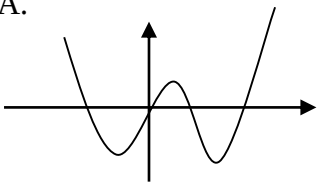
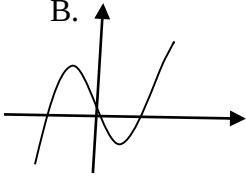
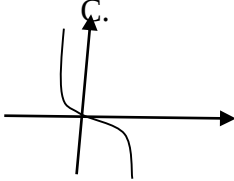
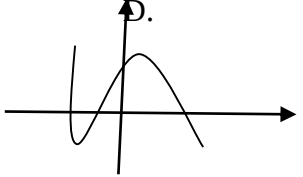
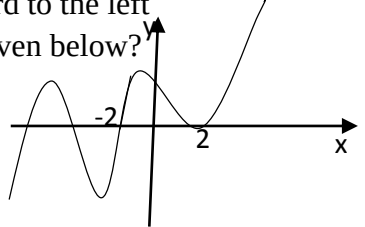


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**ODA SPECIAL BOARDING SCHOOL ADAMA BRANCH MATHEMATICS PRACTICE QUESTION
FOR SUMMER TUTOR FOR GRADE 10TH STUDENTS IN AUGUST 2019
FOR EACH OF THE FOLLOWING QUESTION CHOOSE THE CORRECT ANSWER FROM THE
GIVEN ALTERNATIVES.**

1. What number should be subtracted from $x^3 + 4x^2 - 7x + 12$, if it is to be perfectly divisible by $x + 3$?
A. 42 B. 13 C. 39 D. None
2. If the graph of a polynomial function $f(x) = kx^4 + x^2 - kx - 20$ pass through the point $(k, 12)$. Then the value of k is equal to _____
A. 2 B. 4 C. 2 and -2 D. 4 and -4
3. If the zeros of a polynomial function of $p(x)$ are -2 and 0, then the zeros of $p(x^2 - 5x + 4)$ is equal to ____
A. 1, 2 and 3 B. 1, 2, 3 and 4 C. -2, 0, 1 and 4 D. 2, 3 and 4
4. The polynomial function $p(x)$ is divided by $x - 1$ and $x + 1$, the remainders are 3 and 5 respectively. Then what is the remainder if $p(x)$ is divide by $(x^2 - 1)$?
A. $4x - 1$ B. $x - 4$ C. $-x + 4$ D. $-4x + 1$
5. When $2x^3 - 5x^2 + 4x - 8$ is divided by $ax^2 + bx + c$, the quotient is $x - 2$, remainder is $bx - a$, then the value of a, b, c are respectively__
A. 2, 1 and 3 B. 2, -1 and 3 C. -2, 1 and 3 D. 2, 1 and -3
6. The degree of zero polynomial function is _____
A. 0 C. Any natural number
B. 1 D. Not defined
7. If $p(x)$ is a polynomial function given as $p(x) = (ax^5 + bx^4 + cx^3 + dx^2 + ex + f)$ where a, b, c, d, e, f are a constant real numbers, then $p(x) + p(-x)$ is equal to
A. $p(x) = 2(bx^4 + dx^2 + f)$ C. 0
B. $2f$ D. $p(x) = -2(bx^4 + dx^2 + f)$
8. The zeros of zero polynomial is _____
A. 0 C. Any real number
B. 1 D. Not defined
9. One of the factor of a polynomial function of $p(x) = (25x^2 - 1) + (1 + 5x)^2$ is
A. $5 + x$ B. $5 - x$ C. $5x - 1$ D. $10x$
10. What the value of remainder if a polynomial $ax^3 + 4x^2 + 3x - 4$ and $x^3 - 4x + a$ leave the same remainder when dived by $x - 3$?
A. -14 B. 1 C. 14 D. -1
11. The area of rectangle in square unit is $4x^2 + 4x - 3$. How much longer is the length than the width of the rectangle?
A. $2x + 3$ B. $2x - 1$ C. 3 D. 4
12. If f and g are a polynomial function with degree m and n , then which one of the following is necessary true

- A. f^2 is of degree $2m$
 B. $f + g$ is of degree $m+n$
 C. $\frac{f}{g}$ is of degree $n-m$
 D. fg is of degree mn
13. If $f(x)$ and $h(x)$ are polynomial function such that $f(x) = x^2 + x - 24$ and $h(t) = x^2$. if $3h(t) = f(2x)$, what are the possible values of x ?
 A. $\{-6\}$ B. $\{4\}$ C. $\{-4, 6\}$ D. $\{-6, 4\}$
14. For what values of a and b , $x-1$ is a common factor of $g(x) = x^6 - 4x^3 + ax^2 + bx - 3$ &
 $f(x) = x^4 - ax^3 + 7bx + 1$, respectively?
 A. $\frac{1}{2}$ and 6 B. $\frac{11}{2}$ and $\frac{1}{2}$ C. $\frac{1}{2}$ and $\frac{11}{2}$ D. $-\frac{11}{2}$ and $\frac{1}{2}$
15. For a polynomial function $f(x) = (1-5x)^2(x-5)^3$, then which one of the following is true?
 A. The graphs of $f(x)$ rise to the left and fall to the right
 B. The constant term is -5
 C. The leading coefficient is positive
 D. The degree of polynomial function is odd
16. Which one of the following is not necessary true?
 A. $x+1$ is a factor of $x^n + 1$, where n is even positive integer
 B. $x+a$ is a factor of $x^n + a^n$, where n is positive integer
 C. $x-a$ is a factor of $x^n + a^n$, where n is odd positive integer
 D. $x-a$ is a factor of $x^n - a^n$ for any real number a and positive integer n
17. Which one of the following is true about the graph of polynomial function of degree n ?
 A. The graph of every polynomial function of degree n crosses the x - axis n times
 B. The range of any polynomial function of degree n is the set of real number.
 C. **The graphs of any polynomial function of degree n can cross y -axis exactly at one point.**
 D. The values of any polynomial function is large in positive When $|x|$ large
18. Which one of the following is not true about the graph of polynomial function of degree n ?
 A. The least turning point of polynomial function of an odd degree have zero while even degree one.
 B. The maximum number of x -intercepts the graph of a polynomial function of degree n can have n
 C. The polynomial function of degree n can have maximum of n real zeros
 D. The least number of x -intercepts the graph of a polynomial function of an odd degree have zero while even degree one.
19. Let $f(x)$ and $g(x)$ be a polynomial with $g(x) \neq 0$ and degree of $g(x) \leq$ degree of $f(x)$. Therefore, according polynomial division theorem, there exist a unique polynomials $q(x)$ and $r(x)$ such that,
 A. $f(x) = g(x)q(x) + r(x)$
 B. $f(x) = g(x)q(x) + r(x)$ and $r(x) = 0$ for any polynomial function $f(x)$ and $g(x)$
 C. $f(x) = g(x)q(x) + r(x)$ where the degree of $r(x) <$ degree of $g(x)$
 D. $f(x) = g(x)q(x) + r(x)$ where the degree of $r(x) >$ degree of $g(x)$
20. Let $f(x)$ and $g(x)$ are two polynomial function, then which one of the following is true
 A. For any polynomial function $f(x)$ and $g(x)$ the degree of their sum is equal to the degree of either of them

- B. For any polynomial function $f(x)$ and $g(x)$ the degree of their difference is equal to the degree of either of them
- C. For any polynomial function $f(x)$ and $g(x)$ the degree of their product is equal to the degree of their sum.
- D. All of them are correct.
21. The area of a rectangle in square feet is $x^2 + 13x + 36$. How much longer is the length than the width of the rectangle?
- A. 4feet B. 5feet C. 9feet D. 13feet
22. Which one of the following is not true about the graphs of polynomials of degree n ?
- A. The least number of turning point of zero for odd degree and one for even degree
- B. The maximum number of x-intercept the graph at most n .
- C. The maximum number of real zeros are at most n
- D. The least number of x-intercept of the graph is one for even and zero for odd degree respectively.
23. Let $f(x) = x^3$, then which of the following is true?
- A. $f(x)$ Has only one root with multiple of 3
- B. $f(x)$ Is an increasing function.
- C. $f(x)$ Has one turning point.
- D. The range of $f(x)$ the set of non-positive number.
24. Which one of the following can be the graph of the polynomial function of degree three with positive leading coefficient?
- A. 
- B. 
- C. 
- D. 
25. Which one of the following is not true about the graphs of the polynomial function $f(x) = 2x^5 - 7x^3 + 2x - 1$?
- A. It is smooth and continuous curve
- B. It has at most 4 turning points and intersects the x-axis at most 5 times.
- C. It passes through the origin.
- D. As we move far from the origin, it rises upward to the right and falls downward to the left
26. Which one of the following is true about the graphs of the polynomial function given below?
- A. The degree of the polynomial function is an even natural number
- B. The constant term of the polynomial function is a negative real number.
- C. They have an even multiplicity at the zeros of the polynomial function $x = 2$
- D. They have an odd multiplicity at the zeros of the polynomial function of $x = -2$
- 
27. Which of the following is the solution set of the equation $2x^3 - 7x^2 + 2x + 3 = 0$?
- A. $\{-3, -\frac{1}{2}, 1\}$
- B. $\{-3, \frac{1}{2}, 1\}$
- C. $\{-1, \frac{1}{2}, 3\}$
- D. $\{-\frac{1}{2}, 1, 3\}$
28. When you divide the polynomial $f(x) = 3x^3 + 2x^2 - 9x + 6$ by $x - 1$, the remainder that you will get is ____
- A. 8 B. 24 C. -8 D. 0

29. Which of the following is not true about the polynomial function of $p(x) = x^3 + 3x^2 - 9x - 27$?
- 3 and 3 are only the real root of the polynomial with multiplicity 2 and 1 respectively.
 - As the values of x is large in absolute they have the same properties with $p(x) = x^3$
 - They have only one local extreme point.
 - The graph of the polynomial function cross y -axis exactly at one point $y = -27$
30. What are the zeros of the polynomial function $f(x) = x^3 + 3x - x - 3$?
- 3, -1 and 1
 - 2, -1 and 3
 - 3, 2 and 3
 - 2, 1 and 2
31. If f is a polynomial function given by $f(x) = 2x^3 + 4x^2 + 5x - 9$, then this functions has root between ____
- 1 and -2
 - 0 and 1
 - 1 and 2
 - 1 and 0
32. For a polynomial functions $f(x) = x^2 - 2x + 2$ and $g(x) = x^2 + 2x + 2$, then the product of $(f.g)(x) = \underline{\hspace{2cm}}$
- $x^4 - 8x + 4$
 - $x^4 - 4x^3 - 8x^2 - 8x + 4$
 - $x^4 - 4x^3 - 6x^2 - 8x + 4$
 - $x^4 + 4$
33. Let $f(x) = (2x)(5x - 4) - 3x + 2$ and $g(x) = 5x^3 - x(x^2 - 2)$, then which one of the following not correct?
- $\left(\frac{g}{f}\right)(1) = 6$
 - $(f.g)(-1) = -6$
 - x is a factor of $(f.g)(x)$
 - The degree of $(f.g)(x)$ is 5
34. What the remainder for $f(x) = 3x^3 + 5x - 4$, $c = 2$
- 20
 - 34
 - 30
 - 16
35. The zeros of $f(x) = \frac{1}{2}(2 - 3x)(3 - x)$ is ____
- 3 and $-\frac{2}{3}$
 - $\frac{2}{3}$ and 3
 - 0 and 3
 - 3 and $-\frac{2}{3}$
36. For what number of k is $x + 1$ is a factor of $f(x) = 2x^6 - kx^2 + 5x - 1$
- 6
 - 4
 - 6
 - 4
37. Which one of the following is a factor of $x^3 - 4x + x + 6$
- $x + 1$
 - $x + 3$
 - $x - 2$
 - $x - 3$
38. Which one of the followig is not rational zeros of $f(x) = x^3 + 3x^2 - x - 3$?
- 1
 - 1
 - 3
 - 3
39. Let $f(x) = (x - 2)\left(\frac{x^2 + 1}{x^2 + 1}\right)$, which one of the following is not true about f ?
- It is polynomial
 - Its degree is 3
 - Leading coefficient is 1
 - None
40. Which one of the following is not polynomial function?
- $\frac{1}{x^{-2}}$
 - $\sqrt{x^4}$
 - $\sqrt{x^2}$
 - $\sqrt[3]{x^3}$
41. What the value of k , when $f(x) = (k - 7)x^3 - x^2 + kx - 1$, is divided by $x + 2$, the remainder is -29
- 6
 - 8
 - 10
 - 5
42. If a polynomial function $f(x) = 2x^5 + 5x^4 + 8x^2 + 1$ is divided by $x + 1$, the remainder is

A. -12

B. 6

C. 12

D. 3

43. The factor of $p(x) = ax^3 + bx + 2$ are $x - 1$ and $x + 2$, then the value of a and b respectively

A. 1 and 3

B. -1 and 3

C. -1 and -3

D. 1 and -3

44. If two polynomial functions f and g has degree m and n respectively, then the degree of fg is___

A. mn B. $m+n$ C. $m-n$ D. n

45. If f and g are two non-zero polynomial functions, which one of the following is not necessarily polynomial function?

A. f^2 B. $fg + \frac{1}{2}f - \frac{3}{4}g$ C. $\frac{2f+3g}{f+g}$ D. $f^2g^2 - 1$

46. Let $f(x) = x^2 + 2x + 1$, then which one of the following is polynomial function?

A. $|f(x)|$ C. $\frac{f(x)}{x+1}$ D. $f(|x|)$ B. $\sqrt{f(x)}$

47. Which one of the following is not a factor of $x^4 - 5x^2 + 4$

A. $x^2 + x - 2$ B. $x^2 - x - 2$ C. $x^2 - 3x + 2$ D. $x^2 + 3x - 2$

48. Which one of the following is not a factor of $x^3 - \pi x^2 - x + \pi$?

A. $x - 1$ B. $x + 1$ C. $x - \pi$ D. $x + \pi$

49. If $x + 2$ and $x - 3$ is a factor of $p(x)$, then which of the following is not necessarily true?

A. x is a factor of $p(x + 3)$ C. x is a factor of $p(x - 2)$ B. $x + 1$ is a factor of $p(x - 3)$ D. $x + 4$ is a factor of $p(x + 2)$

50. For what value of a , $x - 3$ is a factor of $2x^2 - (ax)^2 - ax - 12$?

A. $-\frac{2}{3}$ and -1 B. $-\frac{2}{3}$ and 1 C. $\frac{2}{3}$ and -1 D. $\frac{2}{3}$ and 1

51. Which of the following interval may not contains the zeros of $f(x) = x^4 - 7x^2 + 10$?

A. $(-2, -1)$ B. $(-1, 0)$ C. $(1, 2)$ D. $(2, 3)$

52. Let f be a polynomial function, if the degree of $f(x)$ greater than or equal to 1. Then what will be the remainder when $f(x)$ is divisible by $x + 3$?

A. $x - 3$

B. 3

C. $f(3)$ D. $f(-3)$

53. If $f(x) = 2x^3 - 3x^2 - 16x + 24$, then which one of the following intervals does not contains the zeros or roots of the given function?

A. $(-3, -2)$ B. $(2, 3)$ C. $(1, 2)$ D. $(-2, -1)$

54. Let $f(x)$ and $g(x)$ be a polynomial functions given as $f(x) = 6x^5 + 4x^4 - 2x^3$ and $g(x) = 3x^2 + 2x - 1$. For

$x \neq -1$ and $x \neq \frac{1}{3}$ then $\frac{f(x)}{g(x)}$ is equal to_____

A. $2x^3 + 1$ B. $3x^2 + 2x - 1$ C. $3x^2$ D. $2x^3$

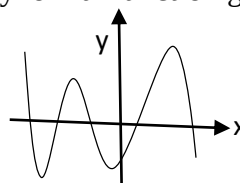
55. Which one of the following is not true about the graphs of polynomial function given below?

A. Its degree is odd

B. Its leading coefficient is positive

C. Zero is its zero with even multiplicity

D. No y-intercept



56. If $f(x)$ and $g(x)$ are two polynomials of degree n and m respectively. Which one of the following is not true?
- A. The degree of $f(x) + g(x)$ is m if $m > n$
 B. $f(x) - g(x)$ may not have degree
 C. The degree of $f(x)g(x)$ is $m+n$
 D. The degree of $f(x^2)$ is $2n$
57. For any positive integer n , $(-1)^{n-1}(-1)$ gives
- A. $(-1)^{n-1}$
 B. $(1)^{n-1}$
 C. $(-1)^n$
 D. -1
58. If $\left(\frac{1}{2}\right)^{2x+1} = 1$, then x is equal to _____
- A. $\frac{1}{2}$
 B. $-\frac{1}{2}$
 C. 1
 D. -1
59. The solution of x if $\left(4^{\frac{1-x}{1+x}} = 4^{\frac{1}{3}}\right)$ is _____
- A. $\frac{1}{3}$
 B. $\frac{1}{2}$
 C. 2
 D. 3
60. If $0.25^{2-x} = \frac{256}{2^{x+3}}$, then x is equal to _____
- A. 3
 B. 2
 C. -3
 D. -2
61. The simplified form of $\left[\left(\frac{(3^{-1} - 9^{-1})}{6}\right)^{\frac{1}{3}}\right]$ is equal to _____
- A. $\frac{2}{9}$
 B. $\frac{9}{2}$
 C. $\frac{1}{3}$
 D. 3
62. The solution set of $e^{2x} = e^x + 6$ is _____
- A. $\{-2\}$
 B. $\{3\}$
 C. $\{-2, 3\}$
 D. $\{\ln 3\}$
63. The solution set of $\frac{1}{5^{2x-4}} = 125$ is _____
- A. $\left\{\frac{1}{2}\right\}$
 B. $\left\{-\frac{1}{2}\right\}$
 C. $\{-2\}$
 D. $\{2\}$
64. If $y = \left(\frac{2^x + 2^{-x}}{2^x - 2^{-x}}\right)$, then when we solve x in terms of y ?
- A. $x = \log_2 \sqrt{\frac{y+1}{y-1}}$
 B. $x = \log_2 \left(\frac{y+1}{y-1}\right)$
 C. $x = \log_4 \sqrt{\frac{y+1}{y-1}}$
 D. $x = \sqrt[4]{\frac{y+1}{y-1}}$
65. If $27(27)^{2x-3} = 81^{3x-5}$, then the values of x is _____
- A. $\left\{-\frac{7}{3}\right\}$
 B. $\left\{-\frac{3}{7}\right\}$
 C. $\left\{\frac{7}{3}\right\}$
 D. $\left\{\frac{3}{7}\right\}$
66. If $2^{x+4}\sqrt[4]{4^{x+8}} = \sqrt[6]{128}$, then x is equal to _____
- A. -34
 B. 34
 C. 68
 D. -68
67. If $x^{+0.5}\sqrt[5]{729} = x^{-0.5}\sqrt[9]{9}$ then x is equal to _____
- A. 1
 B. -1
 C. 2
 D. -2

68. If $10^x = (0.1)1000^{x-1}$, then the values of x is ____

A. $\{1/2\}$

B. $\{-1/2\}$

C. $\{-2\}$

D. $\{2\}$

69. If $\frac{27^{3x-2}}{243} = 81^{3x-7}$, then the values of x is ____

A. $\{-17/3\}$

B. $\{-3/17\}$

C. $\{17/3\}$

D. $\{3/17\}$

70. For what value(s) of x the equation of $\frac{4^x}{2^{x+5}} = 3^{x+5}$?

A. $\{1/5\}$

B. $\{1/5\}$

C. $\{5\}$

D. $\{-5\}$

71. The solution set of $3^{x-1} + 3^{x-2} + 3^{x-3} = 13$ is ____

1. 3 2. 4

3. 2

4. 1

72. The solution set of $2^{x-1} + 2^{x-2} + 2^{x-3} = 448$ is ____

A. $\{9\}$

B. $\{-9\}$

C. $\{512\}$

D. $\{-512\}$

73. If $\frac{10^{\frac{1}{3}} \cdot 1000}{10^x} = 0.01$, then the value of x is ____

A. $-3/16$

B. $-16/3$

C. $16/3$

D. $3/16$

74. If $8^{x-1} - 2^{3x-2} + 8 = 0$ then the solution set is ____

A. $\{2\}$

B. $\{-2\}$

C. $\{3\}$

D. $\{4\}$

75. If $3^{5x-4} + 3^{5x} = 82$, then the value of x is ____

A. $-4/5$

B. $-5/4$

C. $4/5$

D. $5/4$

76. For what value of x , the equation of $4^{x-2} = 0.125$

A. $\{-1/2\}$

B. $\{1/2\}$

C. $\{2\}$

D. $\{-2\}$

77. For what value of x , the equation of $\sqrt{5^{3x} + 19} - \sqrt{5^{3x} - 4} = 1$

A. $\{-1/2\}$

B. $\{2\}$

C. $\{1\}$

D. $\{-1\}$

78. What the value of x , if $2\left(\frac{243}{32}\right)^{2x} = 3\left(\frac{8}{27}\right)^{\frac{2}{3}x-1}$?

A. $1/6$

B. 6

C. $1/3$

D. 3

79. The solution of $2^x \cdot 5^x = 0.1(10^{x-1})^5$ is ____

A. $-2/3$

C. $3/2$

B. $-3/2$

D. $2/3$

80. The solution set of $2^x + 3^{x-2} = 3^x - 2^{x+1}$ is

A. $\{3/2\}$

B. $\{2/3\}$

C. $\{3\}$

D. $\{-3\}$

81. The solution set of $\left(\frac{3}{5}\right)^{x+4} = \left(4 \frac{17}{27}\right)^{3x+2}$ is ____

- A. $\{-\frac{1}{2}\}$ B. $\{2\}$ C. $\{1\}$ D. $\{-1\}$
82. Given $g(x) = 9\log_8(x-3) - 5$, $g^{-1}(13) =$ _____
 A. 31 B. 6 C. 61 D. 67
83. $\log_b(a) = x$ and $\log_b(c) = y$, then $\log_{a^2}(\sqrt[3]{b^5c^4}) =$ _____
 A. $\frac{5}{4} + y^4$ B. $\frac{5+4y}{6x}$ C. $2x + 4y$ D. $2x + \frac{20y}{3}$
84. The solution set of the equation $\log_2[2x+3] = 4$ is _____
 A. $\{19/2\}$ B. $\{1/2\}$ C. $\{13/2\}$ D. $\{5/2\}$
85. What the values of x that makes $2^{2x-1} = 3$
 A. $x = \log 2 - \log 3$ B. $x = 1/2(\log_2 3) + 1$ C. $x = 1/2(1 + \log_2 3)$ D. $x = 1/2 + (\log_2 3)$
86. The solution set of the equation $(25^{2x-1})\left(\frac{1}{125}\right)^{x+2} = 625$ is equal to _____
 A. $\{12\}$ B. $\{8\}$ C. $\{4\}$ D. $\{2\}$
87. If $\left(\frac{1}{125}\right)^{a^2+4ab} = (\sqrt[3]{625})^{3a^2-10ab}$, and if a and b do not equal to zero, $\frac{a}{b}$ is equal to _____
 A. 4/21 B. 2 C. 76/21 D. 4
88. Which of the following is false about the graph of $f(x) = 5^{x-3}$
 A. The range is $y > 0$. B. For $x < 0$, $0 < f(x) < \frac{1}{125}$ C. The graph crosses the y-axis at $(0, \frac{1}{125})$ D. The asymptote of the graph is the line $y = 3$
89. What is the simplified form of $\frac{(5^{\sqrt{3}})^3(625)^{-\sqrt{3}}}{(5^{\sqrt{3}})^{-1}}$
 A. 1 B. $5^{1-\sqrt{3}}$ C. $5^{-\sqrt{3}}$ D. $5^{2-\sqrt{3}}$
90. Which of the following is necessarily true?
 A. For $a > b > 1$, $a^x < b^x$ for $x > 0$ B. For $0 < a < b < 1$, $a^x > b^x$ for $x > 0$ C. For $a > b > 1$, $a^x < b^x$ for $x < 0$ D. For $0 < a < b < 1$, $a^x < b^x$ for $x < 0$
91. From the following statements which one is false about the graphs of $f(x) = 6^x$ and $g(x) = (\frac{1}{6})^x$?
 A. $f(x)$ is increasing whereas $g(x)$ is decreasing B. They are mirror image of one another about the y-axis. C. For $x < 0$, $f(x) < g(x)$ D. For $x > 0$, $0 < f(x) < 1$
92. What is the value of x if $49^{2x}(\frac{1}{7})^{x+2} = (343)(7^x)^{-2}$?
 A. $\frac{1}{2}$ B. -2 C. 1 D. 2
93. If $\log 2 = x$ and $\log 5 = y$, then $\log 12.5$ is equal to,
 A. $x-2y$ B. $y-2x$ C. $2x-y$ D. $2y-x$

94. If $\log_3 x = \log_6 2x$, what is the value of x ?

- A. 2 B. 3 C. 4 D. -2

95. Given that $\log^6 = 0.7782$ the mantissa of $\log^{0.06}$ is

- A. 0.7782 B. -1.2218 C. -2 D. -1

96. If $f(x) = \log_4^x$ and $g(x) = \log_{\frac{1}{4}}^x$, then which of the following is true about these function?

- A. For all values of $x > 1$ both graphs are increasing.
 B. One is obtained by reflecting the other about the x -axis.
 C. $(0, 1)$ is their common point.
 D. Their domain is the set of real number.

97. The solution set of $\log_3^{(3+\log_3^{x+3})} = 0$ is;

- A. $\{\frac{-8}{9}\}$ B. $\{\frac{-15}{9}\}$ C. $\{\frac{-26}{9}\}$ D. $\{\frac{13}{9}\}$

98. The solution $\log^{(x+10)} + \log^{(x-5)} = \log^{100}$ is _____

- A. $\{-10, 5\}$ B. $\{10, -15\}$ C. $\{10, 15\}$ D. $\{10\}$

99. The roots of the equation $x^2 + ax - b = 0$ are -2 and 3. What are the values of a and b respectively?

- A. 1 and 6 B. -1 and 6 C. 6 and -1 D. -1 and -6

100. The solution set of $|6 - 4x| = |2x - 12|$ is;

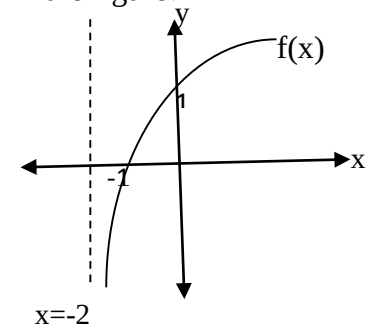
- A. $\{4, -3\}$ B. $\{4, 3\}$ C. $\{-3, 1\}$ D. $\{-3, 3\}$

101. Which of the following systems of equation is inconsistent?

- A. $\begin{cases} 3x + 3y = 12 \\ -3x + 3y = -10 \end{cases}$ B. $\begin{cases} 5x + 8y = 24 \\ 10x + 16y = 48 \end{cases}$ C. $\begin{cases} 7x + 9y = 30 \\ 14x - 18y = 54 \end{cases}$ D. $\begin{cases} 6x - y = 8 \\ 12x - 2y = 15 \end{cases}$

102. Which of the following functions can be represented by the graph shown in the figure?

- A. $f(x) = \log_2^{(x+2)}$ Ans. C. $f(x) = -\log_2^{(x+2)}$
 B. $f(x) = -2 + \log_2^x$ D. $f(x) = 2 - \log_2^x$

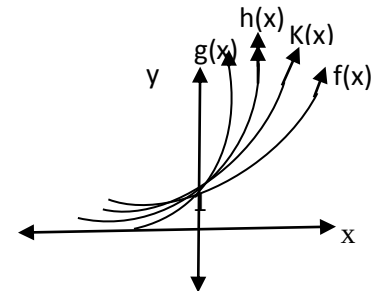


103. If $a > 1$, then for what values of x , $\log_a^x > 0$?

- A. $0 < x < 1$
 B. $x < 0$
 C. $x > 1$
 D. $\mathbb{R}$

104. The following graph represents the graphs of exponential functions. Which of the following functions represent the graphs of $f(x)$, $g(x)$, $k(x)$ and $h(x)$ respectively?

- A. $7^x, 5^x, 8^x$ & 3^x
 B. $3^x, 8^x, 5^x$ & 7^x
 C. $3^x, 5^x, 7^x$ & 8^x
 D. $8^x, 7^x, 5^x$ & 3^x



105. Which of the following pairs of functions are inverses of each other?

- A. $f(x) = 5^x$ & $g(x) = \log_{\frac{1}{5}}^x$
- B. $f(x) = \log_4^x$ & $g(x) = \log_{\frac{1}{4}}^x$
- C. $f(x) = 3^x$ & $g(x) = 3^{-x}$
- D. $f(x) = 6^x$ & $g(x) = \log_6^x$
106. What is the value of k , so that the equation $kx^2 + 5x + k = 0$ has no solution?
- A. $(-\infty, -\frac{5}{2}) \cup (\frac{5}{2}, \infty)$
- B. $(-\infty, -\frac{5}{2}] \cup [\frac{5}{2}, \infty)$
- C. $(\frac{-5}{2}, \frac{5}{2})$
- D. $[\frac{-5}{2}, \frac{5}{2}]$
107. Which of the following points is not on the graph of $y = \log_2^x$?
- A. (0, 1)
- B. (2, 1)
- C. (1, 0)
- D. $(\frac{1}{2}, -1)$
108. Function f is said to be exponential function, where
- A. $f(x) = a^x, a \in R, \text{ and } a \neq 1$
- B. $f(x) = a^x, a > 0, \text{ and } a \neq 1$
- C. $f(x) = a^x, a \neq 0$
- D. $f(x) = a^x, a > 0$
109. If $\log_x(1/8) = -3/4$, then what is x ?
- A. $\frac{1}{16}$
- B. $\frac{1}{8}$
- C. 8
- D. 16
110. The solution set of $\log_2^{x-2} + \log_2^x = 3$ is _____
- A. 4
- B. $1 + \sqrt{7}$
- C. -2 and 4
- D. $1 + \sqrt{7}$ and $1 - \sqrt{7}$
111. For what value of x the equation $2xb^{40g}b^x = 486$?
- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. 2
- D. 3
112. Given $10^{0.3462} = 2.219$ then $\log \sqrt{2219}$ is equal to
- A. 0.7924
- B. 0.3076
- C. 3.6924
- D. 1.673
113. Let $f(x)$ and $g(x)$ be exponential function given by $f(x) = a^x$ and $g(x) = b^x$, for $a > 1, b > 1$ then which of the following statement is true?
- A. $f(x) > g(x)$ for all $x > 0$ and $a < b$
- B. $f(x) < g(x)$ for all $x < 0$ and $a < b$
- C. $f(x) > g(x)$ for all $x > 0$ and $a > b$
- D. $f(x) < g(x)$ for all $x > 0$ and $a > b$
114. If $f(x)$ and $g(x)$ a logarithmic functions whose bases are reciprocals of each other, then which one of the following statement is true?
- A. They have reciprocal values for all x
- B. There are some equal values of x for which both $f(x)$ and $g(x)$ are positive
- C. They have opposite sign for all $x \neq 1$
- D. They can never have equal values for any x
115. The solution set of $\log_2^{[2+\log_3(x+3)]} = 0$ is equal to:
- A. $\{-1\}$

B. $\left\{\frac{1}{3}\right\}$

C. $\{\}$

D. $\left\{\frac{-8}{3}\right\}$

116. $A = Pe^{rt}$ Is the formula for the amount (A) of money accumulated, where P is principal invested with an annual interest rate r compounded annually for t years? Which one of the following expressions gives the time that is required to double the money invested?

A. $\ln \sqrt{2r}$

B. $\ln\left(\frac{r}{2}\right)$

C. $\ln\left(\frac{2}{r}\right)$

D. $\frac{\ln r}{2}$

117. If two functions $y = a^x$ and $y = \log_a x$ for $a > 0$ and $a \neq 1$ are given, then along which line shall we reflect the graph of one of them in order to get the graph of the other?

A. The y-axis

B. The x-axis

C. The line $y = -x$ D. The line $y = x$

118. If $f(x)$ and $g(x)$ are logarithmic functions whose bases are reciprocals of each other, then which one of the following statement is true?

A. They have reciprocal values for all x

C. They have opposite sign for all

B. There are some equal values of x for which both $f(x)$ and $g(x)$ are positive

D. They can never have equal values for any x

119. For $x > 0$ and $x \neq 1$ find the value of x where, $\log_x \frac{4}{9} = \frac{-2}{3}$?

A. $\sqrt[3]{\frac{3}{2}}$

B. $\frac{3}{2}$

C. $\frac{2}{3}$

D. $\frac{27}{8}$

120. Let $f(x) = \left(\frac{3}{4}\right)^x$ and $g(x) = \left(\frac{4}{3}\right)^x$, which of the following statement about $f(x)$ and $g(x)$ is true?

A. If $x < 0$, then $g(x) < 1$ and if $x > 0$, then $f(x) < 1$ C. If $x < 0$, then $f(x) < g(x)$ B. If $x < 0$, then $g(x) > 1$ and if $x > 0$, then $f(x) > 1$ D. $x > 0$, then $f(x) > g(x)$

121. The solution set of $(3^{5x})(9^{x^2}) = 27$ is equal to _____

A. $\left\{-\frac{1}{2}, 3\right\}$

B. $\left\{\frac{1}{2}, -3\right\}$

C. $\left\{-\frac{1}{2}, -3\right\}$

D. $\left\{\frac{1}{2}, 3\right\}$

122. If $3^{x+1} - 3^x = 162$ then the value of x is _____

A. 4

B. -4

C. 2

D. -2

123. In the equation of $4^{x+1} - 8(4)^{x-1} = 32$ then x is equal:

A. 2

B. -2

C. 4

D. 6

124. In the equation of $4(3^{x+1}) - 3^{x+2} - 3^{x-1} = 72$ then x is equal:

A. 4

B. 6

C. 3

D. 12

125. If $3^{x+2} + 3^{x+1} + 2(3^x) = 126$ then x is equal:

A. 2

B. 3

C. 1

D. 4

126. If $7(3)^{x+1} - 5^{x+2} = 3^{x+4} - 5^{x+3}$, then x is equal:

A. -1

B. -3

C. -4

D. 6

127. If $3^{2\sqrt{x^2-3}}(3) - (3)3^{\sqrt{x^2-3}} + 6\sqrt{x} - 18 = \sqrt{x}(9^{\sqrt{x^2-3}} - 3^{\sqrt{x^2-1}})$, then the solution set is____
 A. $\{9, 3, -3\}$ B. $\{-9, 2, -2\}$ C. $\{9, 2, -2\}$ D. $\{-9, 3, -3\}$
128. If $\left(\frac{1}{4}\right)^{2-\sqrt{5x+1}} = 4(2)^{\sqrt{5x+1}}$, then x is equal to____
 A. 2 B. 5 C. 7 D. 8
129. If $3(4^x) + \frac{9^{x+2}}{3} = 6(4)^{x+1} - \frac{9^{x+1}}{2}$, then x is equal to____
 A. $\frac{1}{2}$ B. $-\frac{1}{2}$ C. -2 D. 2
130. If $9^{x+2} + 5(9^{x+1}) = 14$, then x is equal to____
 A. -1 B. 1 C. 2 D. 3
131. Which of the following is the solution of $2^{2x} - 2^{x+2} - 3(2)^x + 12 = 0$ if $\log 2 \approx 0.30$ and $\log 3 \approx 0.48$ is given approximately in two decimal places
 A. 1.2 and 2 B. 1.6 and 2 C. -1.6 and 2 D. 1.2 and -2
132. The simplified form of the expression of $(2^{-3} + 3^{-2})^{-1}$ is equal to____
 A. $\frac{17}{72}$ B. $\frac{72}{17}$ C. $\frac{8}{72}$ D. $\frac{9}{72}$
133. The solution set of the logarithmic equation of $\log_x^{(6x-5)} = 2$ is equal to____
 A. $\{1, 5\}$ B. $\{1\}$ C. $\{5\}$ D. $\{\}$
134. Which of the following statements is not correct?
 A. $\log(1 \times 2 \times 3) = \log 1 + \log 2 + \log 3$ C. $\log_{10} 10 = 1$
 B. $\log(2 + 3) = \log(2 \times 3)$ D. $\log_{10} 1 = 0$
135. If $\log \frac{a}{b} + \log \frac{b}{a} = \log(a + b)$ then:
 A. $a^2 - b^2 = 1$ B. $a + b = 1$ C. $a - b = 1$ D. $a = b$
136. If $\log 2 = 0.3010$ and $\log 3 = 0.4771$, the value of $(\log_5 512)$ is:
 A. 2.870 B. 2.967 C. 3.876 D. 3.912
137. Which one of the following is **not** necessarily true?
 A. $\log_b^x > \log_c^x$ for $x > 1$, if $1 < c < b$ C. $\log_b^x > \log_c^x$ for $x > 1$, if $0 < c < b < 1$
 B. $\log_b^x < \log_c^x$ for $0 < x < 1$, if $1 < c < b$ D. $\log_b^x > \log_c^x$ for $0 < x < 1$, if $0 < c < b < 1$
138. $\frac{\log \sqrt{8}}{\log 8}$ is equal to:
 A. $\frac{1}{8}$ B. $\frac{1}{\sqrt{8}}$ C. $\frac{1}{2}$ D. $\frac{1}{4}$
139. If $\log 27 = 1.431$, then the value of $\log 9$ is:
 A. 0.934 B. 0.945 C. 0.954 D. 0.958
140. The expression of $(\log_x a)(\log_a b)$ as a single logarithm is____
 A. $(\log_x a)$

B. $(\log_x b)$

C. $(\log_b a)$

D. $(\log_a b)$

141. If $\log 5 = a$ and $\log 3 = b$, then what the value of A in terms of a and b in the equation of $\log_3 x = A \log_5 x$?

A. ab

B. $\frac{b}{a}$

C. $\frac{a}{b}$

D. $a + b$

142. For what value of a , the graph of $y = \log_a x$ passes through the point $(e, 2)$?

A. e^2

B. $e^{\frac{1}{2}}$

C. e^{-2}

D. e

143. If $\log_x \left(\frac{9}{16} \right) = -\frac{1}{2}$, then the value of x ?

A. $-\frac{3}{4}$

B. $\frac{3}{4}$

C. $\frac{81}{256}$

D. $\frac{256}{81}$

144. Given : $\log_8(5) = b$, then the value of $\log_4(10)$ in terms of b is equal to_____

A. $\left(\frac{1-3b}{2} \right)$

B. $\left(\frac{1+3b}{2} \right)$

C. $\left(\frac{3b-1}{2} \right)$

D. $\left(\frac{b+3}{2} \right)$

145. For what x the equation $\log [\log (2 + \log_2(x + 1))] = 0$

A. $2^8 - 1$

B. $2^7 - 1$

C. $2^7 + 1$

D. $2^8 + 1$

146. The simplified form of $\log_6(216) + \frac{(\log(42) - \log(6))}{\log(49)}$ is equal to _____

A. $-\frac{7}{2}$

B. $\frac{7}{2}$

C. $-\frac{2}{7}$

D. $\frac{2}{7}$

147. If $\log_x \left(\frac{1}{8} \right) = -\frac{3}{4}$ then what is the value x ?

A. 4

B. 8

C. 16

D. 32

148. What is the solution set of the equation $4^{2x+2} = 4^{2x-1} + 126$?

A. $\{3\}$

B. $\left\{ \frac{3}{4} \right\}$

C. $\left\{ \frac{4}{3} \right\}$

D. $\{\}$

149. Which of the following exponential equations is indirectly explains the statement “5 is a logarithm of 243 to the base 3”?

A. $5 = 3^{243}$

B. $3 = 5^{243}$

C. $243 = 3^5$

D. $243 = 5^3$

150. Suppose $\log_3 2 = a$ and $\log_3 5 = b$ then $\log_3 0.0002$ is equal to_____

A. $-3a - 4b$

B. $a - b$

C. $b - a$

D. $3a + 4b$

151. Which one of the following is exponential function ?

A. $f(x) = \left(\frac{1}{2} \right)^x$

B. $h(x) = 3^{\frac{1}{x}}$

C. $f(x) = x^3$

D. $g(x) = \sqrt[3]{x}$

152. If Br 1000 is invested today at the rate of 4% compounded semi-annually. What will be the amount after one year?

A. 2080.80 Birr

B. 1040.40 Birr

C. 1040 Birr

D. 2080 Birr

153. The solution set of $4^{2x+2} = 4^{2x-1} + 126$?

A. $\{3\}$

C. $\left\{ \frac{3}{4} \right\}$

D. $\left\{ \frac{4}{3} \right\}$

B. $\{6\}$

154. The solution set of $25^{1-x} \sqrt{125}$

A. $\frac{1}{2}$

B. $\frac{3}{2}$

C. $-\frac{1}{2}$

D. $\frac{1}{4}$

155. What the value of x in $\left(\frac{125}{27}\right) = \sqrt[3]{0.6}$

A. $-\frac{1}{9}$

B. $-\frac{1}{3}$

C. $\frac{1}{9}$

D. 1

156. If $16(3^x) = 81(2^x)$ then x is _____

A. 4

B. 1

C. 3

D. 2

157. What is the solution set of $(0.1)^y = (\sqrt[3]{10})^2$?

A. $-\frac{3}{2}$

B. $-\frac{2}{3}$

C. $\frac{2}{3}$

D. $\frac{1}{3}$

158. Find the solution set of $(2)^{x^2} = \frac{4^{-1}}{8^{-2x+1}}$

159. Starting at the age of 40, an average man loses 5% of his hair every year. At what age should an average man expect to have half his hair left? $40 + 13.51 \dots =$ **54 years old.**

160. Birr 15 000 is invested in an account that yields 5% interest per year. After how many years will the account be worth Birr 91 221.04 if the interest is compounded yearly? **37 years.**

161. Birr 8 000 is invested in an account that yields 6% interest per year. After how many years will the account be worth Birr 13709.60 if the interest is compounded monthly? **9 years.**

162. A bacteria culture starts with 1000 bacteria and the number doubles every 40 minutes.

A. Find a formula for the number of bacteria at time t .

A. $f(t) = 10000 \cdot 2^{1.5t}$ Where t is the number of hours.

B. Find the number of bacteria after one hour.

(b) 28.284 bacteria.

C. After how many minutes will there be 50 000 bacteria? **(c) 92.88 minutes**

163. ODA has birr 3600 and wish to invest it until it becomes at least birr 6000. How many years will this take assuming that interest rate remain at 8% compounded annually?

164. Find

a. PH, if $[H^+] = 4 \times 10^{-2}$ mole liter

ANSWER: PH=1.3979<7, so it is acid

b. $[H^+]$, if PH of vinegar is 3.1004

ANSWER: $[H^+] \approx 1260$

165. Solve for x the equation $9^x - 3^x - 8 = 0$

166. The simplified form of $\left(\frac{1}{a-b} + \frac{1}{a+b}\right) \div \frac{1}{a} \left(2 + \frac{2b^2}{a^2 - b^2}\right)$

answer=1

167. Suppose $\log_3^2 = a$ and $\log_3^5 = b$, then find $\log_3^{0.0002} = a$

ANSWER= $4b - 3a$

168. Find the solution set of $\log_2^{(3+\log_4^{x+4})} = 0$

ANSWER= $x = 12$

169. Given $1.962 = 10^{0.2924}$, then find $\log_{10}^{\sqrt[4]{1962}}$?

ANSWER= $\frac{3.2924}{4} = 0.8231$

170. Solve

A. $\left(\frac{9}{25}\right)^{x-1} \left(\frac{125}{27}\right)^x = \left(\frac{3}{5}\right)^{x+2}$

ANSWER, $x = -2$

B. $2^{2x} - 2^x - 12 = 0$

ANSWER, $x = 2$

C. $2^{2x+1} + 2^x = 10$

ANSWER, $x = 1$

171. If $\log_c \frac{a}{b} = x - y$ and $\log_c ab^2 = x + y$, then find $\log_b \sqrt[3]{a}$?

172. Find the universe and solve for x

A. $3\log_x^{16} - 4\log_{16}^x = 2\log_2^x$ **ANSWER, universe = $x:(0,1) \cup (1,\infty)$ and $x = \{1/4, 4\}$**

B. $\log_{1/3} \left(\log_{1/2}^x \right) = -1$ **ANSWER, universe = $x:(0,\infty)$ and $x = \{\sqrt{3}\}$**

C. $\log_9^{4x} = \log_{4x}^9$ **ANSWER, universe = $x:(0,1) \cup (1,\infty)$ and $x = \{1/36, 9/4\}$**

173. If $\log_b^{x-y} = 4$, $\log_b^{x+y} = 8$ and $\log_b^y = 2$, then find

A. $\log_b \left(\left(\frac{x}{y} \right)^2 - 1 \right)$ **ANSWER=8**

B. $\log_b \left(\frac{x^4 - y^4}{x^2 + y^2} \right)$ **ANSWER=12**

174. If $\log_a^3 = x$, and $\log_a^2 = y$, then find $\log_{\sqrt{3}}^{\sqrt[3]{2}}$? **ANSWER = $\frac{2y}{3x}$**

175. If $\log 2 = 0.3010$ and $5^x = 400$, then find the value of x ? **ANSWER = $\frac{2.6020}{0.699} = 3.7225$**

176. Solve for x the equation $4^{x-2} = 3^{x+4}$

177. Solve $x y^m = y x^3$ for m

178. The solution set of a quadratic equation with absolute value of $|x^2 + 4x| - 3x - 6 = 0$ is _____

A. $\{-3, 2\}$ B. $\{-6, -1\}$ C. $\{-1, 2\}$ D. $\{-6, 2\}$

179. The solution set of a quadratic equation with absolute value of $x^2 + |x-1| = 1$ is _____

A. $\{-2, 1\}$ B. $\{0, 1\}$ C. $\{-2, 0\}$ D. $\{1\}$

180. The solution set of $x^2 + 4|x| - 12 = 0$ is _____

A. $\{-2, 6\}$ B. $\{2, -6\}$ C. $\{-2, 2\}$ D. $\{-6, 6\}$

181. Given that $a < 0 < b$ then which one of the following is not necessary true?

A. $|a-b| = b-a$ C. $\left| \frac{b}{a} \right| = -b/a$
B. $|ab-a| = a-ab$ D. $|ab-a| = a-ab$ if $|ab| \geq |a|$

182. Let a relation $R = \{(x, y) : y \geq x, y \geq -x \text{ and } y \leq 3\}$, then the domain of the relation is _____

A. $[-3, 0]$ B. $[0, 3]$ C. $[-3, 3]$ D. $(-3, 3)$

183. Which one of the following pair of linear inequalities that describes the set of all points in the first quadrant?

A. $\begin{cases} x \geq 0 \\ y \leq 0 \end{cases}$ B. $\begin{cases} x > 0 \\ y \leq 0 \end{cases}$ C. $\begin{cases} x \geq 0 \\ y \geq 0 \end{cases}$ D. $\begin{cases} x \geq 0 \\ y > 0 \end{cases}$

184. The area triangle whose triangular region is lies in $\begin{cases} x \geq -1 \\ y \leq 2 \\ y \geq x-1 \end{cases}$ is _____

- A. 4 sq. units B. 8 sq. units C. 12 sq. units D. 16 sq. units
185. The solution set of a quadratic equation with absolute value of $|x^2 + 4x| - 3x - 6 \geq 0$ is ____
- A. $(-\infty, -2] \cup [2, \infty)$ C. $[2, \infty)$
 B. $(-\infty, -2]$ D. $[-2, 2]$
186. Find the solution set of quadratic inequalities with absolute notation $|x^2 + 3x + 2| \leq 2x + 4$
- A. $(-\infty, -3]$ B. $[-2, 1]$ C. $(-\infty, -3] \cup [-2, \infty)$ D. $[-2, \infty)$
187. For what value(s) of k is $kx^2 + 6 - 1 > 0$ for each real number x?
- A. $(-9, \infty)$ B. $(9, \infty)$ C. $(-\infty, 9)$ D. $(0, \infty)$
188. For what value of k, the solution set of $-4x^2 + kx + 1 > 0$ is empty set?
- A. $(-\infty, -4) \cup (4, \infty)$ C. $[-4, 4]$
 B. $(-\infty, -4] \cup [4, \infty)$ D. $(-4, 4)$
189. The solution set of $(6 + x - x^2 > 0)$ is equal to
- A. $(-\infty, \infty)$ B. $(-\infty, -2) \cup (3, \infty)$ C. $(-\infty, 2) \cup [3, \infty)$ D. $(-2, 3)$
190. The solution set of inequality $x^2 + 7x + 12 \geq 0$ is ____
- A. $\{x : x \leq 3 \text{ or } x \geq 4\}$ C. $\{x : -3 \leq x \leq -4\}$
 B. $\{x : x \leq -4 \text{ or } x \geq -3\}$ D. $\{x : 3 \leq x \leq 4\}$
191. What the value(s) of k, so that $(3k - 4)x^2 + 2kx - 1 = 0$ has two distinct real root?
- A. $(-1, 4)$ C. $(-\infty, -1) \cup (4, \infty)$
 B. $(-4, 1)$ D. $(-\infty, -4) \cup (1, \infty)$
192. For what value(s) of k, the solution set of $2x^2 + kx + 1 < 0$ is empty set?
- A. $(-\infty, -\sqrt{8}) \cup (\sqrt{8}, \infty)$ C. $(-\sqrt{8}, \sqrt{8})$
 B. $(-\infty, -\sqrt{8})$ D. $(\sqrt{8}, \infty)$
193. The solution set of $|2x - 5| \geq 3$ is
- A. $\{x : x \leq -1 \text{ or } x \geq 4\}$ C. $\{x : 1 \leq x \leq 4\}$
 B. $\{x : x \leq -4 \text{ or } x \geq -1\}$ D. $\{x : x \leq 1 \text{ or } x \geq 4\}$
194. The sum of a non-negative number and its square is less than 12. What could the number be?
- A. $[0, 3)$ B. $[0, 3]$ C. $(0, 3)$ D. $(0, 3]$
195. The solution set of $x^2 - 2x - 24 < 0$ is
- A. $\{x / x < -6 \text{ Or } x > 4\}$ C. $\{x / x : -6 < x < 4\}$
 B. $\{x / x < -4 \text{ Or } x > 6\}$ D. $\{x / x : -4 < x < 6\}$
196. The solution set of $x^2 - x - 20 > 0$ is?
- A. $\{x / x < -4 \text{ Or } x > 5\}$ C. $\{x / x : -4 < x < 5\}$
 B. $\{x / x \leq -4 \text{ Or } x \geq 5\}$ D. $\{x / x : -5 < x < 4\}$
197. Which of the following contains the solution set of $(x - 3)^2 - 1 \geq 0$
- A. $\{x : x \leq 2 \text{ or } x \geq 4\}$ C. $\{x : 1 \leq x \leq 3\}$
 B. $\{x : x \leq 1 \text{ or } x \geq 3\}$ D. $\{x : 2 \leq x \leq 4\}$

198. The solution set of $|2-3x| > 1$ can be given by:

A. $\{ \}$

B. $\left(\frac{1}{3}, 1\right)$

C. $\left[\frac{1}{3}, 1\right]$

D. $\left(-\infty, \frac{1}{3}\right) \cup (1, \infty)$

199. The solution set of $-5 \leq x+2 \leq 6$ can be given as;

A. $[-3, 8)$

B. $[-7, 4)$

C. $[-7, 4]$

D. $[-7, 8)$

200. From the following sets which one is the solution set of $3x - 2x^2 > 0$?

A. $(-\infty, 0) \cup \left(\frac{3}{2}, \infty\right)$

B. $[-\infty, 0] \cup \left[\frac{3}{2}, \infty\right]$

C. $\left(0, \frac{3}{2}\right)$

D. $\left[0, \frac{3}{2}\right]$

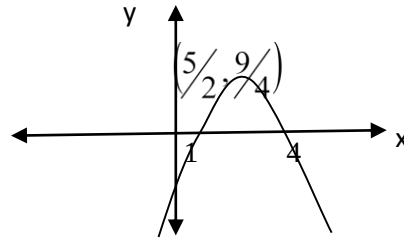
201. If the figure below is the graph of the function $y = -x^2 + 5x - 4$, what is the solution set of the inequality $-x^2 + 5x - 4 \leq 0$

A. $(-\infty, 1] \cup [4, \infty)$

B. $(-\infty, 1) \cup (4, \infty)$

C. $\left(\frac{5}{2}, \infty\right)$

D. $[1, 4]$



202. From the following sets, which one is the solution set $2x^2 + 4x + 1 = 0$

A. $\left\{-1 - \frac{\sqrt{2}}{2}, -1 + \frac{\sqrt{2}}{2}\right\}$

C. $\left\{-1 + \sqrt{2}, -1 - \sqrt{2}\right\}$

D. $\{ \}$

B. $\left\{-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right\}$

203. Which one of the following is the set of $|2x-5| = x+8$

A. $\{-1, 13\}$

B. $\{ \}$

C. $\{-13/3, 13\}$

D. $\{-13, 1\}$

204. A farmer has 8m by 10m plot of land. He needs to construct a water reservoir at one corner of the plot with equal length and width as shown below. For what values of x is the area of the remaining part less than the area needed for the reservoir?

A. $(-\infty, -2\sqrt{10}) \cup (2\sqrt{10}, \infty)$

B. $(-\infty, 2\sqrt{10})$

C. $(2\sqrt{10}, 8)$

D. $(8, \infty)$



205. The equation of the line which passes through the vertex of parabola $y = (x+2)^2 + 4$ whose slope is $-\frac{3}{4}$ equal to

A. $y + 4 = -\frac{3}{4}(x + 2)$

C. $y - 4 = -\frac{3}{4}(x - 2)$

B. $y - 4 = -\frac{3}{4}(x + 2)$

D. $y + 4 = \frac{3}{4}(x + 2)$

206. Two perpendicular lines intersect at the point $(1, 5)$. If the slope of one line is 3, what is the equation of the other line?

- A. $y = -3x + 8$ B. $y = -\frac{1}{3}x + \frac{16}{3}$ C. $y = -\frac{1}{3}x + 2$ D. $y = -\frac{1}{3}x + \frac{14}{3}$
207. Which of the following lines is perpendicular to the line given by the equation $y = -\frac{1}{6}x + 8$?
- A. $y = -6x - 8$ B. $y = \frac{1}{6}x + 8$ C. $y = 6x + 8$ D. $y = -\frac{1}{6}x + 8$
208. Which of the following lines is parallel to the line given by the equation $4y = 6x - 6$?
- A. $y = -\frac{3}{2}x + 6$ B. $y = -\frac{2}{3}x + 6$ C. $y = \frac{3}{2}x + 6$ D. $y = \frac{2}{3}x + 6$
209. What is the distance from the point $(-x, y)$ to the point $(x, -y)$?
- A. $2(\sqrt{x^2 + y^2})$ units B. $(x + y)$ Units C. $(x^2 + y^2)$ Units D. $\sqrt{x^2 + y^2}$ units
210. Line A is perpendicular to line B. If the slope of line A is multiplied by 4, what must the slope of line B be multiplied by in order for the lines to still be perpendicular?
- A. -4 B. $-\frac{1}{4}$ C. 4 D. $\frac{1}{4}$
211. If P(-1, 2) and Q(5, -3) are a points on the coordinates plane, so that Q is the midpoint of $\overline{PR}$, then what are the coordinates of point R?
- A. (11, -8) B. (7/2, -2) C. (-2, 5 1/2) D. (2, -6)
212. Which one of the following is the equation of a line whose y-intercept and x-intercept are 1 and -2, respectively?
- A. $-2x + y - 1 = 0$ C. $x - y + 2 = 0$
B. $2x - y - 2 = 0$ D. $x - 2y - 1 = 0$
213. The equation of the line that passes through the point (2, -1) and perpendicular to the line $2x + 4y + 3 = 0$ is given by:
- A. $x + 2y = 0$ C. $x - 2y + 2 = 0$
B. $-2x + y - 4 = 0$ D. $-2x + y + 5 = 0$
214. The equation of the perpendicular bisector of the segment joining A(-9, 2) to B(3, -4) is
- A. $y + 1 = 2(x + 3)$ C. $y + 1 = -\frac{1}{2}(x + 3)$ D. $y - 1 = -\frac{1}{2}(x - 3)$
B. $y + 3 = 2(x + 1)$
215. If the point (1, x), (5, 2) and (9, 5) are collinear then the value of x is ____
- A. 5/2 B. -5/2 C. -1 D. 1
216. If A(-4, 3), B(4, -3) and $C(3\sqrt{3}, 4\sqrt{3})$ are the vertices of the triangle, then this type of triangle is ____
- A. Equilateral triangle C. Right angle triangle
B. Isosceles triangle D. Scalene triangle
217. Which one of the following points is NOT equidistant from the points (1, 2) and (4, 5)
- A. (7, 1) B. (15, -9) C. (-2, 8) D. (7, -1)
218. From the following equations, which one is the equation of the line through the points P(-1, -2) and Q(3, 1)?
- A. $y - 2 = \frac{3}{4}(x - 1)$ C. $y - 2 = -\frac{1}{2}(x - 1)$
B. $y + 2 = \frac{3}{4}(x + 1)$ D. $y + 2 = -\frac{1}{2}(x - 1)$
219. Which one of the equation of line is perpendicular to AB, where A (-4, 0) and B (0, 4) which pass through mid-point of AB?
- A. $x + y = 0$ B. $x + y = 4$ C. $x - y = 0$ D. $x - y = 4$
220. Which one of the following equations of line is perpendicular to $x - y = 4$?

- A. $x + y = 0$ B. $-x + y = 1$ C. $y - 2x = 2$ D. $x + y = 1$
221. Find the equation of the straight line whose slope is 2 and y-intercept is -3?
A. $Y = 2/3x - 1$ B. $Y = 3x - 2$ C. $Y = 2x - 3$ D. $Y = -6x - 4$
222. Find equation of line passing through (2, -1) and parallel to $2x - y = 4$
A. $2/5x - y = 1$ B. $5x - y = 2$ C. $2x - y = 5$ D. $2y - x = 5$
223. Find the coordinates of point on x-axis, which is at the distance of 5 units from the point (6, -3)?
A. (2, 0) and (10, 0) C. (2, 10) and (0, 0)
B. (0, 2) and (0, 10) D. (-2, 0) and (-10, 0)
224. Find equation of the straight line passing through (2, 3) and perpendicular to $3x + 2y + 4 = 0$?
A. $5/3x - y = 2$ B. $2x - 3y = -5$ C. $3y - 2x = -5$ D. $3y - 5x = -2$
225. Find the coordinates of the point which will divide the line joining the point (3, 5) and (11, 8) externally in the ratio 5: 2.
A. (5/3, 1/3) B. (3/49, 1/10) C. (49/3, 10) D. (3/49, 10)
226. What is the slope of the line passing through the points J (-2, 3) and (2, 7)?
A. $\sqrt{4}$ B. 2 C. $\sqrt{2}$ D. 1
227. Find equation of the line parallel to the line passing through (5,7) and (2,3) and having x-intercept as -4 is
A. $3y = 4x - 16$ C. $3y = 4x$ D. $4y = 3x + 16$
B. $4y = 3x - 16$ +16
228. In the standard (x, y) coordinate plane, the midpoint of AB is (-2, 7) and A is located at (-1, 4). Which of the following gives the coordinates of point B?
A. (0, 1) B. (-1, 3) C. (-1, 5) D. (-3, 10)
229. If the point with coordinates (3, y₁) lies on the graph $y = -5x + 4$, what is the value of y₁?
A. 19 B. -1/5 C. 4 D. -11
230. The sides of a square are 3 cm long. One vertex of the square is at (2,0) on a square coordinate grid marked in centimeter units. Which of the following points could also be a vertex of the square?
A. (5,0) B. (0,1) C. (1,-1) D. (4,1)
231. Which of the following is the equation of a line that is parallel to the line $4x - y = 22$ and passes through the origin?
A. $(1/4)x + y = 0$ B. $4x - y = 0$ D. $4x + 8y = 0$
C. $4x = 8y$
232. Which of the following points does not lie on the line $2y + 5x - 4 = 0$?
A. (-0.8, 0) B. (-1, 0.5) C. (0, 2) D. (2, 3)
233. Here are four straight line equations.
1. $3y = 4x + 5$, 2. $4y = 3x - 1$, 3. $4y + 3x = 7$, 4. $4x + 3y = 2$. Which one of the following statements is true?
A. Lines 1 and 2 are perpendicular C. Lines 2 and 4 are perpendicular
B. Lines 1 and 4 are parallel D. Lines 2 and 3 are parallel.
234. A straight line has equation $10y = 3x + 15$. Which of the following is true?
A. The gradient is 0.3 and the y-intercept is 1.5 C. The gradient is 15 and the y-intercept is 3
B. The gradient is 3 and the y-intercept is 15 D. The gradient is 1.5 and the y-intercept is 0.3
235. P is the point (4,-2). Q is the point (-3,-5). What is the length PQ?
A. $\sqrt{50}$ B. $\sqrt{98}$ C. $\sqrt{40}$ D. $\sqrt{58}$
236. P is the point (3, 5). Q is the point (-1, 9). R is the midpoint of PQ. Which one of the following lines does R lie on?
A. $y = x + 6$ B. $y = x + 8$ C. $y = x - 6$ D. $y = x - 8$
237. The lines $y = 5x - 3$ and $y = 2x + 9$ intersect at P. What are the coordinates of P?
A. (2,7) B. (2,13) C. (4,17) D. (-4,-23)
238. A is the point (1, 5), B is the point (4, 7) and C is the point (5, 2). Triangle ABC is
A. right-angled B. scalene with no right angle

C. equilateral

D. isosceles

239. Let PQRS is the vertices of a rectangle such that P (-4, -1) and Q (-4, -1) and $PQ=2(QR)$. Then find the coordinate of R and S?
240. Find eq
241. Determine the value of k so that P (3, 0), Q (k, 2) and R (2, 4) are collinear.
242. If A (-1, 2) and B (5,-3) are points on the coordinate plane so that R is midpoint of $\overline{AB}$, then find the coordinates of R.
243. Given three points E (1, 0), F (-3, 0) and G (1, 2). Then find the equation of a line through E and perpendicular to $\overline{FG}$.
244. Find the coordinates of M on $\overline{ST}$ for S (-3, 0), T (0,-3) such that $\frac{SM}{MT} = \frac{2}{3}$.
245. Find the value of k, if A(k,3), B(2k-1,k) and C(-1,1) are vertices of right angled triangle $\triangle ABC$ with hypotenuse $\overline{AB}$.
246. Find the coordinate of a point on the y-axis which is equidistant from A (-2,4) and B(7,9).
247. If A(2,-2) and B(5,2) are two opposite vertices of square, then determine;
- A. The area of square
 - B. The coordinates of the other vertices.
 - C. The length of its diagonal
248. For what value of k is the distance between E(k+2, 3) and F(-2, k-1) is $\sqrt{40}$?
249. Determine the measure of angles of a triangle with vertices A(-3,-2), B(1, -2) and C(-1, $2\sqrt{3}$)
250. Find the equation of a line which passes through (3,5) that is;
- a. Parallel to $2x - y = 14$
 - b. Perpendicular to $-3x + 4y = 6$
251. What is the angle of inclination of a line which passes through the points A(-2,5) and B(2,7)?
252. What is the equation of a line whose angle of inclination is 120° that passes through a point P(-4, 9)?
253. If points A(3,1), B(-1,1) and C(1,3) are vertices of a triangle and R, S, and T are mid points side AB,BC and AC respectively ; then what is the equation of a line containing a line segment ST?
254. What is the equation of a line which x-intercept 5 and y-intercept -3?
-
255. Which of the following angles have the same related angle with -200° ?
- A. 560°
 - B. 200°
 - C. 160°
 - D. -160°
256. $\frac{\sin 20^\circ}{\cos 110^\circ} \sin 30^\circ$ Is equal to ____
- A. $\frac{1}{2}$
 - B. $-\frac{1}{2}$
 - C. -2
 - D. 2
257. Angle E of rhombus EFGH measures $3x + 5$. If the measure of angle H is $4x$, what is the measure of angle F?
- A. 20°
 - B. 80°
 - C. 100°
 - D. 120°

258. Angle A of rhombus $ABCD$ measures 120° . If one side of the rhombus is 10 units, what is the length of the longer diagonal?
- A. 5 units B. $5\sqrt{3}$ units C. 10 units D. $10\sqrt{3}$ units
259. The measures of the angles of $\triangle QRS$ are $m\angle Q = 2x + 4$, $m\angle R = 4x - 12$, and $m\angle S = 3x + 8$. $QR = y + 9$, $RS = 2y - 7$, and $QS = 3y - 13$. The perimeter of $\triangle QRS$ is__
- A. 11 B. 20 C. 44 D. 55
260. If θ is an angle in the second quadrant measured in the counter clockwise direction, then
- A. $\csc\theta = \frac{1}{\sin(180^\circ - \theta)}$ B. $\csc\theta = -\frac{1}{\sin\theta}$ C. $\sec\theta = \frac{1}{\cos(180^\circ - \theta)}$ D. $\cot\theta = \frac{1}{\tan(180^\circ - \theta)}$
261. Two men A and B stands on opposite sides of a 150m tall tower if A observes the top of the tower at an angle of elevation of 60° and B observes the same point at an angle of 30° . Then how far apart are the two women?
- A. $600\sqrt{3}m$ B. $100\sqrt{3}m$ C. $200\sqrt{3}m$ D. $450\sqrt{3}m$
262. Which of the following is the measure of an angle that co-terminal with the angle of -125° ?
- A. -55° B. $\frac{25}{30}\pi$ radian C. $-\frac{47}{36}\pi$ radian D. 235°
263. 5.205^0 is equal to: - ____
- A. $5^0 20' 05''$ B. $5^0 12' 18''$ C. $5^0 18' 05''$ D. $5^0 20' 12''$
264. If from the top of hill 600m above sea-level the angle of depressions of two boats in a line with the observer where found to be 30° and 60° then the distance between two boats was ____
- A. 400m B. $400\sqrt{3}m$ C. $200\sqrt{3}m$ D. $300\sqrt{3}m$
265. If $\sin 15^\circ = x$ and $\sin 75^\circ = y$ then which of the following is correct?
- A. $\cot 75^\circ = \frac{y}{x}$ B. $\tan 15^\circ = \frac{x}{y}$ C. $\cot 15^\circ = \frac{x}{y}$ D. $\tan 75^\circ = \frac{x}{y}$
266. Which one of the following the properties of the tangent function?
- A. Its graphs is decreasing in the interval of $(-\frac{\pi}{2}, \frac{\pi}{2})$
- B. Its graphs is never crosses the line at which $\theta = \frac{\pi}{2} + n\pi$, where $n \in \mathbb{Z}$
- C. Its range is $\{y: y \neq n\frac{\pi}{2}, \text{ where } n \text{ is an odd integer}\}$
- D. Its domain is $\{\theta: \theta \neq n\frac{\pi}{2}, \text{ where } n \text{ is an odd integer}\}$
267. If $\tan\theta = -2$, and $\cos\theta < 0$, then which one of the following is true?
- A. $\csc\theta = \frac{\sqrt{5}}{2}$ B. $\sec\theta = -\frac{\sqrt{5}}{2}$ C. $\sec\theta = -\frac{1}{\sqrt{5}}$ D. $\cot\theta = 2$
268. Which of the following is positive number?
- A. $\cos 170^\circ$ B. $\cos(-260^\circ)$ C. $\cos 250^\circ$ D. $\cos(-280^\circ)$
269. Which one of the following is true about the second quadrant angle θ in standard position whose terminal side lies on the line $2x + y = 0$?
- A. $\sin\theta = \frac{1}{\sqrt{5}}$ B. $\cos\theta = \frac{2}{\sqrt{5}}$ C. $\sin\theta = \frac{2}{\sqrt{5}}$ D. $\cos\theta = \frac{1}{\sqrt{5}}$
270. Which of the following trigonometric values is undefined?
- A. $\cot(\frac{3}{2}\pi)$ B. $\sec(3\pi)$ C. $\tan\pi$ D. $\csc\pi$
271. If $\cos\theta = -\frac{1}{\sqrt{10}}$ and θ is in 3rd quadrant, then

A. $\csc\theta = -\frac{\sqrt{10}}{3}$

B. $(\sec\theta)^2 = \frac{1}{4}$

C. $\cot\theta = \frac{1}{\sqrt{5}}$

D. $\tan\theta = \frac{1}{3}$

272. The diagonals of rhombus measure 12cm and 16cm. which of the following is true about the interior obtuse angle β of the rhombus?

A. $\tan\frac{\beta}{2} = 0.6$

B. $\sin\frac{\beta}{2} = 0.8$

C. $\cos\frac{\beta}{2} = 0.8$

D. $\tan\frac{\beta}{2} = 0.75$

273. Which of the following is not true for $0 \leq \theta \leq \frac{\pi}{2}$?

A. $\csc\theta = \sin(\frac{\pi}{2} - \theta)$

C. $\cos\theta = \sin(\frac{\pi}{2} - \theta)$

B. $\sec\theta = \csc(\frac{\pi}{2} - \theta)$

D. $\tan\theta = \cot(\frac{\pi}{2} - \theta)$

274. Form the following expressions which one is equivalent to $\sin(-\frac{7\pi}{6})$?

A. $\sin(\frac{5\pi}{6})$

B. $\sin(30^\circ)$

C. $\sin(\frac{\pi}{6})$

D. $\sin(45^\circ)$

275. Let $f(\theta) = \tan\theta$, for $0 \leq \theta \leq 2\pi$, then which one of the following is not correct?

A. The graph of f is increasing in the interval of $[0, 2\pi]$

C. $f(\theta) = 0$, for $\theta = 0, \pi$, and 2π

D. The period of f is π

B. The range of f is the set of real number

276. The values of $\tan 1050^\circ =$ ____

A. $\frac{\sqrt{3}}{3}$

B. $-\frac{1}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{2}$

D. $\sqrt{3}$

277. If $\sin\theta = -\frac{2}{3}$ and $\tan\theta > 0$, then which of the following is not true?

A. $\cot\theta = \frac{\sqrt{5}}{2}$

B. $\sec\theta = \frac{3}{\sqrt{5}}$

C. $\csc\theta = \frac{3}{2}$

D. $\cot\theta = \frac{1}{2}$

278. From a point of a ground, which is 100m away from the wall of a building the angle of elevation of the top of building is 72° . What is the height of building?

A. $\frac{100}{\tan 72^\circ}m$

B. $100\tan 72^\circ m$

C. $100\cos 72^\circ m$

D. $100\sin 72^\circ m$

279. If the measure of an angle 583° in clockwise direction, then in which quadrant does its terminal sides fall?

A. IV

B. III

C. II

D. I

280. Which one of the following is not equal to $\cos 72^\circ$?

A. $\sin 72^\circ$

B. $\cos(-648^\circ)$

C. $\cos 432^\circ$

D. $\sin 18^\circ$

281. If $\sin 18^\circ = 0.31$ and $\cos 18^\circ = 0.95$, which one of the following is correct?

A. $\cot 162^\circ = -\frac{95}{31}$

B. $\sec 162^\circ = \frac{10}{95}$

C. $\csc 162^\circ = \frac{10}{31}$

D. $\tan 162^\circ = \frac{31}{95}$

282. The values of $\csc(\frac{11\pi}{2}) =$ ____

A. Undefined

B. -1

C. 0

D. 1

283. If $\sin\theta = \frac{2}{3}$ For an acute angle θ , then which of the following is correct?

A. $\cot\theta = \frac{4}{5}\sqrt{5}$

B. $\sec\theta = \frac{3}{5}\sqrt{5}$

C. $\csc\theta = \frac{6}{5}\sqrt{5}$

D. $\tan\theta = 2$

284. Suppose a building casts shadow of length 45m when the angle of elevation of the sun is 30° . How the height of the building?

A. $\frac{45}{2}\sqrt{3}m$

B. $45\sqrt{3}m$

C. $15\sqrt{3}m$

D. $\frac{45}{2}\sqrt{2}m$

285. Which one of the following is correct about an angle θ that given in the standard position and whose terminal side contains a point $(2, -1)$?

A. $\cos\theta = \frac{2}{\sqrt{5}}$

B. $\sin\theta = \frac{2}{\sqrt{5}}$

C. $\sin\theta = \frac{1}{\sqrt{5}}$

D. $\tan\theta = \frac{1}{2}$

286. Using the basic trigonometric identities for non-quadrantal angle the transformed form of the expression $\cot\theta\sec\theta$ is equal to_____

A. $\cos\theta$

B. $\sin\theta$

C. $\csc\theta$

D. $\tan\theta$

287. Which one of the following relationships hold correct?

A. $\cos 130^\circ = -\cos 50^\circ$

C. $\tan 200^\circ = -\tan 20^\circ$

B. $\tan 130^\circ = \tan 50^\circ$

D. $\sin 130^\circ = \sin 30^\circ$

288. The value of $\cos\left(-\frac{7\pi}{6}\right) =$ _____

A. $-\frac{\sqrt{3}}{2}$

B. $\frac{\sqrt{3}}{2}$

C. $-\frac{1}{2}$

D. $\frac{1}{2}$

289. From the following trigonometric values which one is equal to $\sin(420^\circ)$?

A. $\sin(-780^\circ)$

B. $\sin(-300^\circ)$

C. $\sin(-60^\circ)$

D. $\sin 30^\circ$

290. What the value of $\cot\left(\frac{2}{3}\pi\right) =$ _____

A. $-\frac{\sqrt{3}}{2}$

B. $\frac{\sqrt{3}}{3}$

C. $-\frac{1}{2}$

D. $-\sqrt{3}$

291. Which of the following is true about rhombus?

A. The consecutive angles of rhombus are not necessary supplementary angle.

B. A rhombus is a quadrilateral with opposite sides are parallel.

C. A rhombus is an equilateral quadrilateral.

D. The diagonals of a rhombus bisect each other perpendicularly.

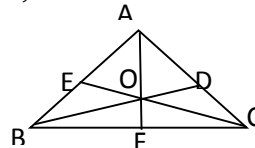
292. In the figure below, $\triangle ABC$ is an isosceles triangle with $AB=AC=15\text{cm}$, while $BC=18\text{cm}$. if the medians AF , BD , and CE , meets at the centroid O , then $AO=$ _____

A. 6cm

C. 8cm

B. 4cm

D. 12cm



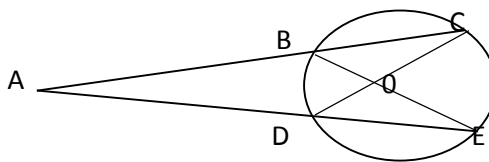
293. In a circle O shown below, $m(\angle COE) = 126^\circ$ and $m(\angle BOD) = 56^\circ$, Then what is the measure of $m(\angle DAB)$?

A. 70°

B. 35°

C. 28°

D. 56°



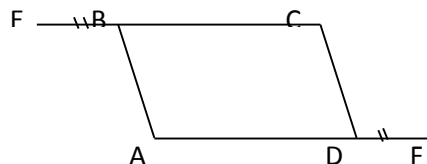
294. In figure below $ABCD$ is a parallelogram with $\overline{AD}$ produced to F and $\overline{CB}$ produced to E such that $\overline{DF} \equiv \overline{BE}$, which one of the following is true about this figure?

A. $AECF$ is a parallelogram.

B. $DE \neq BF$

C. If $ABCD$ is square, then $AECF$ is also square.

D. $\triangle ABE \equiv \triangle DCF$



295. If $\triangle ABC$ Has vertices $A(-11, 4)$, $B(-3, 8)$, and $C(3, -10)$. The coordinates of the center of the circle circumscribed about $\triangle ABC$ are

- A. $(-2, -3)$ B. $(-3, -2)$ C. $(3, 2)$ D. $(2, 3)$ E. $(-1, -1)$

296. Isosceles $\triangle QRS$ has dimensions $QR = QS = 60\text{cm}$ and $RS = 30\text{cm}$. The centroid of QRS is located at point T .

What is the distance from T to QR ?

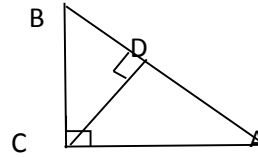
- A. $2\sqrt{15}\text{cm}$ B. $52\sqrt{15}\text{cm}$ C. $3\sqrt{15}\text{cm}$ D. $72\sqrt{15}\text{cm}$ E. $5\sqrt{15}\text{cm}$

297. On the coordinate plane $A(-3, 3)$, $B(1, 5)$ and $C(3, -1)$ are vertices of $\triangle ABC$, what is the coordinate of the point at which the medians intersect?

- A. $(1/3, 7/3)$ B. $(5/3, 4/3)$ C. $(1/3, 11/3)$ D. $(-4/3, 8/3)$

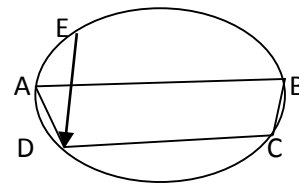
298. In right angled triangle $\triangle ABC$ shown in Figure below, $\overline{CD}$ is altitude to the hypotenuse $\overline{AB}$. If $\overline{AC} = 5$ units and $\overline{AD} = 4$ units, find the length of $\overline{BD}$?

- A. 9 units
B. 4 units
C. $4/9$ units
D. $9/4$ units



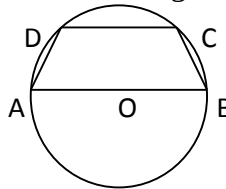
299. In the figure below if $\overline{AB}$ is the diameter of the circle, $\overline{AB} \parallel \overline{DC}$, $m(\angle ADE) = 30^\circ$, and $m(\angle ABD) = 20^\circ$, then $m(\angle BCD)$ is equal to__

- A. 120°
B. 130°
C. 110°
D. 100°



300. Consider a circle with center O and diameter $\overline{AB}$, as shown in figure below. If $m(\angle DAB) = 72^\circ$ and $AD \cong DC$, then $m(\angle ADC) =$ _____

- A. 108°
B. 144°
C. 72°
D. 36°



301. If a metallic right circular cylinder of height 18cm and base radius 4cm is melted down to form sphere, then which one of the following is correct about this sphere?

- A. The diameter of the sphere is $12\sqrt[3]{4\pi}\text{cm}$ D. The radius of the sphere is $\frac{3}{\sqrt[3]{2}}\pi\text{cm}$
B. The volume of the sphere is $48\pi\text{cm}^3$
C. The surface area of the sphere is $144\pi\text{cm}^2$

302. The base of a right triangular prism is a right-angled triangle. If the height of a prism is 10cm and the longest side of the base is 5cm while the shortest one is 3cm , then what is the total surface area of this prism?

- A. 150cm^2 B. 165cm^2 C. 126cm^2 D. 132cm^2

303. From a right circular cone of a height 6cm a frustum with bases of radii 2cm and 6cm is obtained. The volume of frustum is equal to__

- A. $208/3\pi\text{cm}^3$ B. $104/3\pi\text{cm}^3$ C. $104\pi\text{cm}^3$ D. $52\pi\text{cm}^3$

304. The base of a pyramid is an equilateral triangle of side 8cm long. If the altitude of this pyramid is 15cm , then which one of the following gives its volume?

- A. $240\sqrt{3}\text{cm}^3$ B. $80\sqrt{3}\text{cm}^3$ C. 160cm^3 D. $48\sqrt{3}\text{cm}^3$

305. "Frustum of a pyramid is, a part of pyramid _____" which of the following phrases correctly complete the above statement?
- That lies above plane which cuts the pyramid parallel to the base
 - Formed by two planes that cut the pyramid below the vertex and parallel to the base.
 - Which is included between the base and a plane that cuts the pyramid parallel to the base.
 - Which is included between the base and any plane that crosses the pyramid.
306. The lower and the upper base of frustum of a right circular cone have radii 6m and 4m respectively. If the height of the frustum is 3m, then which one of the following is its volume?
- $298\pi m^3$
 - $76\pi m^3$
 - $34\pi m^3$
 - $62\pi m^3$
307. For a given right circular cylinder, its height is twice of the diameter of the base. If the lateral surface area of this cylinder is 288π square inches, then what is its volume?
- $512\sqrt{2}\pi in^2$
 - $115\sqrt{288}\pi in^2$
 - $864\sqrt{2}\pi in^2$
 - $864\pi in^2$
308. A right circular cylinder with radius of the base 5cm and height 8cm is open from the top. What is the total surface area of the cylinder?
- $200\pi cm^2$
 - $105\pi cm^2$
 - $80\pi cm^2$
 - $130\pi cm^2$
309. The altitude of a right circular cone is 8 units long and radius of its base is 6 units. Which one of the following is the total surface area?
- $96\pi unit^2$
 - $60\pi unit^2$
 - $84\pi unit^2$
 - $66\pi unit^2$
310. If the base of a regular pyramid is an equilateral triangle of side 6units long. If the altitude of this pyramid is 12units, then it's volume is ____
- $128\sqrt{3} unit^3$
 - $36\sqrt{3} unit^3$
 - $64\sqrt{3} unit^3$
 - $192 unit^3$
311. Find the total surface area of the hemisphere with radius 6 units long?
- $108\pi unit^2$
 - $36\pi unit^2$
 - $144\pi unit^2$
 - $72\pi unit^2$
312. If the frustum is formed from a regular pyramid, then which one of the following statement is true about its lateral faces?
- Their altitude are not equal
 - Their areas are not equal
 - They are isosceles trapezium
 - They are rhombus
313. The lower and upper bases of a frustum of a regular pyramid are square with measure of sides 4m and 3m respectively if the altitude of the frustum is 6m then its volume is equal to ____
- $(50+4\sqrt{3})m^3$
 - $30m^3$
 - $60m^3$
 - $74m^3$
314. The height of a right circular cylinder is 6cm. if the radius of its base is 3cm. what is the total surface area of the cylinder?
- $54\pi cm^2$
 - $36\pi cm^2$
 - $45\pi cm^2$
 - $64\pi cm^2$
315. If the diameter of the sphere is 16cm, then its surface area is equal to ____
- $1024\pi cm^2$
 - $128\pi cm^2$
 - $256\pi cm^2$
 - $64\pi cm^2$
316. The figure shown below is a container made from an inverted frustum of a right circular cone. The radius of its lower base is 10cm and that of upper base is 15cm. if the height of the container is 20cm. then which of the following is equal to its volume?
- $\frac{9500}{3}\pi cm^3$
 - $5000\pi cm^3$



B. $\frac{2500}{3}\pi cm^3$

D. $7500\pi cm^2$

317. The base of a pyramid is an equilateral triangle of side 8cm long. If the altitude of this pyramid is 15cm, then which one of the following gives its volume?

A. $240\sqrt{3}cm^3$

B. $80\sqrt{3}cm^3$

C. $160cm^3$

D. $48\sqrt{3}cm^3$

318. A wooden sphere of radius 3cm is drilled along its diameter by a metal driller. The Driller has a shape right circular cylinder of radius 1cm. after the drilling, what is the volume of the remaining part of the sphere?

A. $24\pi cm^3$

B. $35\pi cm^3$

C. $42\pi cm^3$

D. $30\pi cm^3$

319. The diameter of base of cone is 6cm and the height is 4 cm then slant height ‘’ is _____

A. 5cm

B. 52cm

C. 7cm

D. 5 cm

320. The line joining the vertex of a cone to the boundary line of the base is called

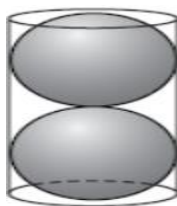
A. Height

B. slant height

C. length

D. perimeter

321. Two spheres of radius 5 cm just fit inside a tube. What the volume inside the tube not filled by the spheres

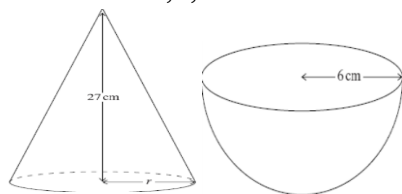


A. $\frac{1000\pi}{3}cm^3$

B. $\frac{500\pi}{3}cm^3$

C. $500\pi cm^3$ D $200\pi cm^3$

322. A hemispherical bowl of radius 6 cm has the same volume as a cone of perpendicular height 27 cm. what the base radius, r, of the cone.



A. 12cm

B. 4cm

C. 3cm

D. 9cm

323. The height of cylinder B is three times the height of cylinder A, and the radius of cylinder B is $\frac{1}{3}$ the radius of cylinder A. Which of the following statements is true?

A. The volume of cylinder B is $\frac{1}{9}$ the volume of cylinder A.

B. The volume of cylinder B is $\frac{1}{3}$ the volume of cylinder A.

C. The volume of cylinder B is the same as the volume of cylinder A.

D. The volume of cylinder B is 3 times the volume of cylinder A.

324. The height of a cylinder is four times the radius of the cylinder. If the volume of the cylinder is $256\pi cm^3$, what is the radius of the cylinder?

A. 8 cm

B. 16 cm

C. 24 cm

D. 4 cm

325. The height of a cylinder is four times the radius of the cylinder. If the volume of the cylinder is $256\pi cm^3$, what is the radius of the cylinder?

A. 4 cm

B. 8 cm

C. 16 cm

D. 24 cm

326. Kajela fills with water $\frac{2}{3}$ of a glass that is 15 cm tall. If the radius of the glass is 2 cm, what volume of water is in Kajela's glass?

A. $10\pi cm^3$

B. $60\pi cm^3$

C. $40\pi cm^3$

D. $30\pi cm^3$

327. The radius of a cylinder is $2x$ and the height of the cylinder is $8x + 2$. What is the volume of the cylinder in terms of x ?
- A. $(16x^2 + 4x)\pi$ B. $(16x^3 + 4x^2)\pi$ C. $(32x^2 + 8x)\pi$ D. $(32x^3 + 8x^2)\pi$
328. The width of a rectangular solid is twice the height of the solid, and the height of the solid is twice the length of the solid. If x is the length of the solid, what is the total surface area of the solid in terms of x ?
- A. $8x^2$ B. $11x^2$ C. $14x^2$ D. $28x^2$
329. The length of a rectangular solid is twice the sum of the width and height of the rectangular solid. If the width is equal to the height and the volume of the solid is 108 in^3 , what is the length of the solid?
- A. 3 in. B. 6 in. C. 8 in. D. 12 in