ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY SPECIAL SCHOOL
GRADE 11 MATHEMATICS PRACTICE QUESTIONS
THIS PAPER CONTAINS MATHEMATICS PRACTICE QUESTIONS FROM UNIT ONE -THREE
FOR EACH OF THE FOLLOWING QUESTION CHOOSE THE CORRECT ANSWER FROM THE GIVEN ALTERNATIVES.

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UNIT ONE *FURTHER ON RELATIONS AND FUNCTIONS*

1. Which of the following is the range of floor function?
   A. Real number B. Natural number C. Integers D. Rational numbers
2. Which one of the following is not true?
   A. A set of points in the Cartesian plane is the graph of a function, if and only if no vertical line intersects the set more than once
   B. For the function $f(x)=\sqrt[3]{x}$, Domain of f = Range of f
   C. A function $f:A\to B$ is a bisection if and only if f is one-to-one and onto
   D. For a,b,c,d constants with $ad-bc\neq 0$, $f(x)=\dfrac{ax+b}{cx+d}$ is not one-to one function
3. Which of the following is one- to-one correspondence function from A= [0, 1] to B= [1, 2]?
   A. $f(x)=\frac{x^3}{3}+1$ B. $f(x)=x^2+1$ C. $f(x)=2x+1$ D. $f(x)=x$
4. Which of the following function is invertible on R?
   A. Modulus function B. Linear function C. Quadratic function D. Cubic function
5. If and ,then (fog)(2) is equal to
   A. 40 B. 45 C. 12 D. 20
6. If $g(x)=3x-5$ and $(g\,of)(x)=3x^2+6x+1$,then $f(x)$ is equal to
   A. x^2+x+1 B. $2x^2+2$ C. x^2+2x+2 D. $3x^2-3x+1$
7. What is the inverse of $f(x)=\frac{x+2}{2x+3}$
   A. $\dfrac{2x-1}{-3x+3}$ B. $f(x)=\dfrac{-3x+2}{2x-1}$ C. $\dfrac{x-2}{2x-3}$ D. $\dfrac{3x+2}{x+2}$
8. If $f(x)=\dfrac{1}{2+x}$, then what is the value of $g(x)=\dfrac{1}{2+f\left(\dfrac{1}{x+2}\right)}$, for $x\neq -2,-1,\dfrac{-3}{2}$?
   A. $\dfrac{8x+3}{3x+2}$ B. $\dfrac{5x+8}{2x+3}$ C. $\dfrac{5x+12}{2x+5}$ D. $\dfrac{2x+5}{5x+12}$
9. Which of the following functions is neither even nor odd?
   A. $f(x)=x-1$ C. $h(x)=x^5$ D. $k(x)=2x^3-3|x|$
   B. $g(x)=x^4$
10. What is the solution set of $1-\dfrac{5}{x^2+4}=\dfrac{x-1}{x^2-x}-\dfrac{1}{x}$?
    A. $\{-1,1\}$ B. $\{-1\}$ C. $\{2\}$ D. $\{-1,1,2\}$
11. Which of the following algebraic expressions is rational expression?
    A. $\left|\dfrac{x^2+1}{x+1}\right|$ B. $\dfrac{x^2+\cos x+2}{x+1}$ C. $3x^4-\sqrt{x^3+1}+2x$ D. $\dfrac{\sqrt{2}\,x^3-x+\log 2}{x^4+x^2+\pi}$

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12. Given $f(x)=2x\operatorname{sgn}x+4$,which of the following is the domain and range of $f(x)$?

A. Dom $f(x)$ =Z, Range $f(x)=[4,\infty)$

B. Dom (f) =R, Range $(f)=(\infty,4]$

C. Dom $(f)=R$,Range $(f)=[-2,\infty)$

D. Dom (f) =R, Range $(f)=(-\infty,-4]$

13. Which of the following is not correct?

A. $f(x)=\operatorname{sgn}x=|x|$

B. $f(x)=x^3\operatorname{sgn}x$ is even function

C. $f(x)=x^2\operatorname{sgn}x$ is odd function

D. If $f(x)=\lfloor x\rfloor$,then $f(-3)\neq f(-2.7)$

14. Given that $f(x)=\dfrac{x-1}{x+1}$,then what is the simplest form of $\dfrac{f(a)-f(b)}{1+f(a)f(b)}$?

A. $\dfrac{ab+1}{a-b},\ a\neq b$

B. $\dfrac{a-b}{ab+1},\ ab\neq -1$

C. $\dfrac{a+b}{ab+1};ab\neq -1$

D. $\dfrac{a-b}{ab-1};ab\neq 1$

15. Which of the following is NOT proper rational expression?

A. $f(x)=\dfrac{x-1}{x^2-9}$

B. $f(x)=\dfrac{x+1}{x^2-4}$

C. $f(x)=\dfrac{x}{x^2-9}$

D. $f(x)=\dfrac{x^3}{x^2-9}$

16. A father is now four times as old as his son .If both he and his son live 20 years longer ,he will be twice as old as his son .what is the present age of the son?

A. 20 B. 15 C. 10 D. 40

17. Which of the following is true about the function $f(x)=\dfrac{x^2+3x+2}{x^2-2x-3}$?

A. The graph of f has vertical asymptote at x=-1

B. The graph of f has a Horizontal asymptote at y=3

C. The graph of f has oblique asymptote at y=1

D. None of the above

18. Which of the following functions has NO Vertical asymptote?

A. $f(x)=\ln(x+2)$

B. $f(x)=\dfrac{x^2+3x+2}{x^2-x}$

C. $f(x)=\dfrac{x^2-1}{x^3+8}$

D. $f(x)=\dfrac{x^2-4}{x-2}$

19. For the function $f(x)=x^2\operatorname{sgn}x$,what is its Domain and Range?

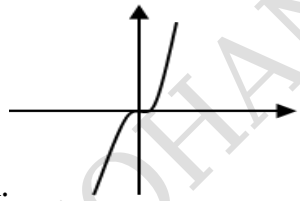
A. $Domain=R$, $Range=[0,\infty)$

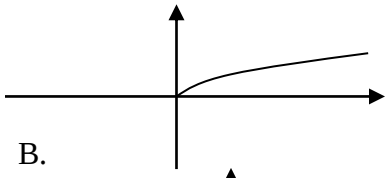
B. $Domain=R$, $Range=R$

C. $Domain=[0,\infty)$, $Range=R$

D. $Domain=[0,\infty)$, $Range=[0,\infty)$

20. Which of the following graphs is the possible graph of the function $f(x)=x^{\frac{n}{m}}$ n is even negative integer and m is odd

A.


B.


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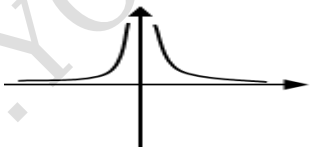
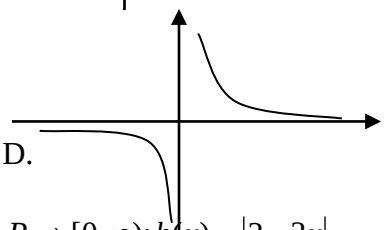


D.


21. From the following which one is not one –to one?

A. $f;R\to R;\ f(x)=3-\dfrac{1}{3}x$

B. $f;\{(1,-2),(1,2),(0,20,(-2,-3)\}$

C. h; $R\to[0,\infty);h(x)=|2-3x|$

D. $f:(-\infty,-1]\to[1,\infty);\ f(x)=\sqrt{1-x}$

22. What is the set of value of A, for which $f:A\to[-2,\infty)$ defined by $f(x)=x^2+6x+7$ is onto

A. $(-\infty,-1]$ B. $[-3,\infty)$ C. $[-4,\infty)$ D. R

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23. If $f(x)=\frac{1}{1+x}$, then what is the value of $g(x)=\frac{1}{1+f\left(\frac{1}{x+1}\right)}$, for $x\neq -2,-1,\frac{-3}{2}$?

A. $\frac{x+1}{x+2}$ B. $\frac{x+2}{x+3}$ C. $\frac{x+2}{2x+3}$ D. $\frac{2x+3}{x+2}$

24. If $f(x)=ax+b, g(x)=x^2+2x, (f\circ g)(2)=1, (f\circ g)(-1)=-1$, then this of the following is Not TRUE?

A. $(f.g)(x)=\frac{1}{9}(2x^3-3x^2-14x)$

B. $(f-g)(0)=-3$

C. $\left(\frac{f}{g}\right)(1)=-\frac{5}{27}$

D. $(f+g)(-1)=-2$

25. If $f(x)=\frac{3}{x-1}$ and $(f\circ g)(x)=\frac{3x}{2-x}$, then $g(x)=$ _____

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

26. Which of the following functions is neither even nor odd?

A. $f(x)=x-1$

B. $g(x)=x^4$

C. $h(x)=x^5$

D. $k(x)=2x^3-3|x|$

27. Given $f(x)=\frac{x-2}{x-1}$ and $h(x)=f\left(\frac{1}{x}\right)$, then which of the following is NOT TRUE?

A. $h(\frac{1}{x})=f(x), x\neq 0,1$

B. Domain of $h(x)=\mathbb{R}\setminus\{0,1\}$

C. $h(x)=\frac{1-2x}{1-x}, x\neq 0,1$

D. is vertical asymptote of $h(x)$

28. Which of the following functions has an inverse function, if f is defined as $f:\mathbb{R}\to\mathbb{R}$

A. $f(x)=|x|$

B. $f(x)=\begin{cases}x, x\geq 0\\ 0, x<0\end{cases}$

C. $f(x)=x^2+1$

D. $f(x)=x^3+1$

29. Which of the following is the inverse of $k(x)=2+\ln(x-1)$?

A. $h(x)=2+e^{x-1}$ B. $h(x)=1+e^{x-2}$ C. $h(x)=2-e^{x-1}$ D. $h(x)=1-e^{x-2}$

30. The **inverse** of $f(x)=\frac{10^x-10^{-x}}{10^x+10^{-x}}+1$ is=_____

A. $\frac{x}{2-x}$ B. $\log_{10}\sqrt{\frac{x}{2-x}}$ C. $\sqrt{\frac{x}{2-x}}$ D. $\log_{10}x$

31. If $f(x)=\frac{\sqrt{x+2}}{x+2}$ and $g(x)=\frac{1}{x}-2$, then $f(g(x))$ is equal to:

A. $\frac{\sqrt{x}}{x}$ B. $\sqrt{x}+2$ C. $\sqrt{x}$ D. $\sqrt{x}-2$

32. If $f(x)=\ln\left(\frac{x}{x-1}+2\right)$, for $x>1$, then which of the following is the inverse of f ?

A. $g(x)=\frac{e^x-2}{e^x-3}$ B. $g(x)=\frac{e^x-2}{e^x+1}$ C. $g(x)=\frac{e^x}{e^x+1}-2$ D. $g(x)=e^{\frac{x}{x-1}}-2$

33. Which one of the following is a one-to-one function?

A. $f=\{(1,6),(2,7),(3,7),(4,8)\}$

B. $k:(0,\infty)\to\Re$ given by $h(x)=\log x$

C. $k:\Re\to\Re$ given by $h(x)=|x-3|$

D. $g=\{(x,y): x$ is a student and y is his/her rank $\}$

34. If $f(x)=\ln(x+1)$ and $g(x)=x^3+7$, then what is the domain of $(fog)(x)$?

A. $(-2,\infty)$ B. $(-1,\infty)$ C. $[-2,\infty)$ D. ϕ

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35. If $f(x)=\dfrac{1}{e^x+1}$, then which of the following is equal to $f^{-1}(x)$?

A. $\ln\left(\dfrac{1}{x+1}\right)$ B. $e^{-x}+1$ C. $\ln(1-x)-\ln(x)$ D. $\dfrac{1}{e^{-x}+1}$

36. If $f(x)=\sqrt[3]{1+e^{-x}}$, which of the following is equal to $f^{-1}(x)$?

A. $\ln\left(\dfrac{1}{x^3-1}\right)$ B. $\dfrac{1}{\ln(x^3-1)}$ C. $\ln(1-x^3)$ D. $(1+e^{-x})^3$

37. If $f(x)=\dfrac{x+1}{x-1}$ and $f(a)=5$ then $f(2a)$ is equal to:

A. 2 B. 4 C. 6 D. 8

38. Which of the following functions is a one-to-one correspondence?

A. $g:\Re\to\Re,\ g(x)=2^x$

B. $h:[0,\infty)\to[0,\infty),\ h(x)=x^2$

C. $r:[0,\infty)\to[0,\infty),\ r(x)=x+5$

D. $f:\Re'\to\Re,\ f(x)=\tan x$, where $\Re'$ is the domain of f.

39. Which one of the following is a one-to-one correspondence function from $A=[0,1]$ to $B=[1,2]$?

A. $f(x)=\dfrac{1}{3}x^3+1$ B. $f(x)=x^2+1$ C. $f(x)=x$ D. $f(x)=2x+1$

40. If $f:A\to B$ and $g:B\to C$ are functions, then which one of the following is true about the composition function?

A. Domain of $(gof)\subseteq$ Domain of f

B. Domain of $(gof)\not\subseteq$ Domain of f

C. Range of $(gof)\not\subseteq$ Range of g

D. Range of $(gof)\subseteq$ Range of f.

41. If the point $(3,-2)$ is on the graph of $y=f(x)$, which point is on the graph of $y=f^{-1}(x)$?

A. $\left(\dfrac{1}{3},-2\right)$ B. $(3,-1)$ C. $\left(3,-\dfrac{1}{2}\right)$ D. $(-2,3)$

42. Which of the following is **NOT** true?

A. The range of the inverse of the relation $R=\{(x,y)\mid y>x^2\ \ and\ \ y\le 4\}$ is $\{y\mid -2\le y\le 2\}$.

B. The domain of the relation $R=\{(x,y)\mid x-y<2\ \ and\ \ x>0\}$ is $\{x\mid x>0\}$.

C. If R is a relation on the set of real numbers, then the graph of R^{-1} can obtained by reflecting the graph of R along the line $y=x$

D. A function is a relation.

43. If $f:\Re\to\Re$ is a function, then which of the following is necessarily **true**?

A. If f is one-to-one, then it is onto.

B. If f is onto, then it is one-to-one.

C. If f is odd, then fof is odd.

D. If f is odd, then $-f$ is even.

44. Suppose $f(1)=3$, and $n=2,3,4,...$, $f(n)=1+f(n-1)$. Which of the following is true?

A. $f(37)$ is a prime number.

B. For any natural number n, $f(f(n))=n+6$

C. If $f(n)$ is odd composite number, then n is even.

D. $\displaystyle\sum_{i=1}^{n} f(i)=\frac{n(n+5)}{2}$

45. If $f(x)=2x+1$ and g is a function such that $f(g(2))=3$, then $g(2)$ is equal to:

A. 1 B. 5 C. 7 D. 3

46. Let $f(x)=3^x$. Then which of the following is **true** for each real numbers x and y?

A. $f(x+y)=f(x)+f(y)$ B. $f(x^2+1)=\dfrac{1}{3}f(x^2)$ C. $f(xy)=f(x)f(y)$ D. $f(x-1)<f(x)$

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47. Given functions $f(x)=x^2-x+3$ and $g(x)=\begin{cases}\dfrac{1}{x-1}, & if\ \ x<3\\ x^2+1, & if\ \ x\geq 3\end{cases}$, then $(gof)(2)$ is equal to:

A. ¼ B. 82 C. 3 D. 26

48. Which of the following is **NOT** true about the function $f(x)=x^{-2}$?

A. Its domain is $\Re\setminus\{0\}$.
B. It is an even function.
C. Its graph has a vertical asymptote.
D. Its range is $\Re$.

49. Which of the following relation is the inverse of the relation $R=\{(x,\ y): y\geq 2x-6\ \ and\ \ 2y-x<8\}$

A. $\left\{(x,\ y): y\geq \frac{1}{2}x+3\ \ and\ \ y<2x-8\right\}$
B. $\{(x,\ y): x\leq 2y-6\ \ and\ \ 2x-y>8\}$
C. $\left\{(x,\ y): y\leq \frac{1}{2}x+3\ \ and\ \ y>2x-8\right\}$
D. $\{(x,\ y): y\leq 2x-6\ \ and\ \ 2y-x>8\}$

50. If $g(x)=2x-3$ and $(fog)(x)=\dfrac{1}{4x-9}$, then $f(x)$ is equal to:

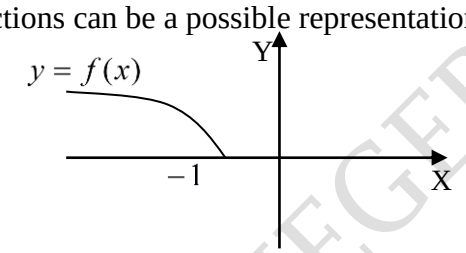
A. $f(x)=\dfrac{1}{2x+3}$ B. $f(x)=\dfrac{1}{2x-15}$ C. $f(x)=\dfrac{1}{2x+15}$ D. $f(x)=\dfrac{1}{2x-3}$

51. Which of the following functions is an odd function?

A. $f(x)=|x|-1$ B. $f(x)=x^3(x+1)$ C. $f(x)=x^3-7$ D. $f(x)=x^2(x-x^2)$

52. Which of the following functions can be a possible representation of the graph shown below?

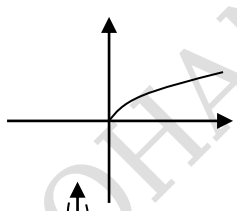
A. $f(x)=\sqrt{1-x}$
B. $f(x)=\sqrt{-x-1}$
C. $f(x)=\sqrt{x+1}$
D. $f(x)=\sqrt{x-1}$

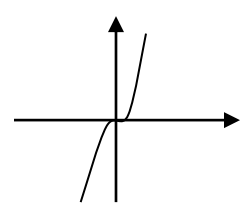


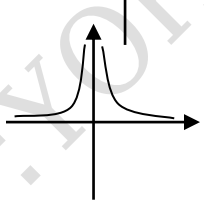
53. Let $f:\Re\to\Re$ and $g:\Re\setminus\{0\}\to\Re\setminus\{0\}$ be two functions defined as $f(x)=x+1$ and $g(x)=\dfrac{1}{x}$. Which of the following statements is **NOT** true?

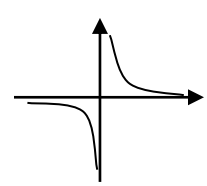
A. $f(g(x))=\dfrac{x+1}{x}$ B. $f(g(-2))=\dfrac{1}{2}$ C. $g(f(-1))=0$ D. $f(f^{-1}(x))=x$ for all $x\in\Re$.

54. Which of the following graphs is the possible graph of the function $f(x)=x^{-n}$, n is even positive integer?

A.


C.


B.


D.


55. If $f(x)=kx+c,\ k\neq 0$, then what is $h(x)$ such that $(hof)(x)=x$?

A. $h(x)=\dfrac{1}{k}x-\dfrac{c}{k}$ B. $h(x)=kx+ck$ C. $h(x)=\dfrac{1}{k}x$ D. $h(x)=2kx$

56. Given $f(x)=\log_3 x$ and $g(x)=x^2+3$, then which of the following is **true**?

A. $(gog)(x)=(\log_3 x)^2$
B. Domain of $(gof)(x)=(-\infty,\ \infty)$
C. Range of $(fog)(x)=[1,\ \infty)$
D. Domain of $(fog)(x)=(0,\ \infty)$

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57. Which of the following pairs of equations **does not** determine the same graph?

A. $y=\log\sqrt{x^2}$ and $y=\log|x|$

B. $y=x\operatorname{sgn}x$ and $y=|x|$

C. $y=|x^3|$ and $y=x^3\operatorname{sgn}x$.

D. $y=x^2\operatorname{sgn}x$ and $y=x^2$

58. The inverse of $f(x)=\log_3^{\sqrt{x-1}}$ is

A. $f^{-1}(x)=3^x+1$ B. $f^{-1}(x)=3^{3x}+2$ C. $f^{-1}(x)=3^{2x}+1$ D. $f^{-1}(x)=3^{2x}+3$

59. Which of the following pair of function is not the inverse of each other?

A. $f(x)=x^3-8$ *and* $\sqrt[3]{x^3+8}$

B. $f(x)=\sqrt{x}$ *and* $g(x)=x^2$

C. $f(x)=\ln(\frac{x}{x-1}+2)$ *and* $g(x)=\frac{e^x-2}{e^x-3}$

D. $f(x)=3x+2$ *and* $g(x)=\frac{x+2}{3}$

60. If $f(x)=4x+1$ and $g(x)=3x+k$,then the value of k for which $(fog)(x)=(gof)(x)$ is

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

61. Which one of the following is not true about the function $f(x)=\frac{3x-2}{4-5x}$ and $g(x)=\frac{3-2x}{4x-1}$?

A. $(gof)(x)=\frac{16-21x}{19x-12}$ B. $f(x)^{-1}=\frac{4x+2}{5x+3}$ C. $g(x)^{-1}=\frac{3+x}{4x+2}$ D. $(fog)=\frac{11-14x}{26x-19}$

62. Let $f(x)=\frac{1-x}{1+x}$,then $f\left(f\left(\frac{\sqrt{x^2+1}}{x+5}\right)\right)$ is equal to

A. $\frac{x+5}{x^2+1}$ B. $\frac{\sqrt{x^2+1}}{x+5}$ C. $\sqrt{\frac{x^2+1}{x+5}}$ D. $\sqrt{\frac{x+5}{x^2+1}}$

UNIT TWO
RATIONAL EXPRESSIONS AND RATIONAL FUNCTIONS

63. The simplest form of the expression $\dfrac{\frac{1}{x+2}+\frac{4}{x-3}}{\frac{2}{x-3}-\frac{7}{x+2}}$ when x ≠ -2,3is

A. $\frac{x+1}{5+x}$ B. $\frac{x+1}{5-x}$ C. $\frac{x+5}{1+x}$ D. $\frac{x-5}{1+x}$

64. Let $f(x)=\frac{x^2-x-2}{x^2-1}$,then which one of the following is not true about the graph of f?

A. It cuts the y-axis at (0,2)

B. It has hole at x=-1

C. It cuts the x-axis at (-2,0)

D. The line y=1 is the horizontal asymptote

65. What is the solution set of the inequality $\frac{x^2-3x+2}{4x^2-4x+1}>0$?

A. $(-\infty,1)\cup(2,\infty)$ B. $(-\infty,\frac{1}{2})\cup(1,2)$ C. $(-\infty,\frac{1}{2})\cup(2,\infty)$ D. $(-\infty,\frac{1}{2})\cup(\frac{1}{2},1)\cup(2,\infty)$

66. What is the value of A,B and C respectively, if the partial decomposition of $\frac{5x^2-9x+19}{x^3-4x^2+5x-20}$ $=\frac{A}{x-4}+\frac{Bx+C}{x^2+5}$

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

67. The solution set of the equation $\frac{x^2}{x+3}+\frac{3x}{x^2+5x+6}=\frac{2x}{x+3}$ is:

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

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68. Which one of the following is the domain of $g(x) = x - \frac{(x^2+1)}{x^4+x}$?

A. $\mathbb{R}\setminus\{0\}$ B. $\mathbb{R}\setminus\{-1\}$ C. $\mathbb{R}\setminus\{0, 1\}$ D. $\mathbb{R}\setminus\{-1, 0\}$

69. Which of the following is the simplified form of $\frac{t-\frac{1}{t}}{1+\frac{t}{1-t}} \div \frac{t^2-2t+1}{t}$, $t \neq 0$ and $t \neq 1$?

A. $t+1$ B. $t-1$ C. $1-t$ D. $-t-1$

70. What are the respective values of A, B and C, so that $\frac{x-1}{x^3+x} = \frac{A}{x} + \frac{Bx+C}{x^2+1}$?

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

71. What is the solution set of $1 - \frac{5}{x^2+4} = \frac{x-1}{x^2-x} - \frac{1}{x}$?

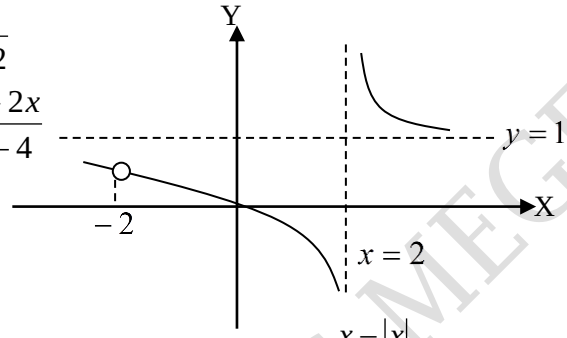
A. $\{1, -1\}$ B. $\{2\}$ C. $\{-1\}$ D. $\{1, 2, -1\}$

72. Which of the following is **NOT** true about the graph of $g(x) = \frac{x^2-1}{x^2+1}$?

A. The range of g is $(-\infty, 1)$.
B. The line $y = 1$ is horizontal asymptote.
C. As $x \to -\infty$, $g(x) \to 1$.
D. g is an even function.

73. Which of the following functions could most likely be drawn as in the figure below?

A. $f(x) = \frac{x}{x-2}$
B. $f(x) = \frac{x^2+2x}{x^2-4}$
C. $f(x) = \frac{x+1}{x-2}$
D. $f(x) = \frac{x^3+2x}{x^2-4}$



74. If $x < 0$, then the simplest form of $f(x) = \frac{x-|x|}{x}$ is equal to:

A. $2x$ B. 2 C. -2 D. 0

75. Which of the following is a simplified form of $\frac{4-(a-2)^2}{a^4+2a^2+1} \div \frac{1-\frac{1}{a^2+1}}{a}$?

A. $\frac{4-a}{a}$ B. $\frac{a}{a^2+1}$ C. $-\frac{1}{a^2(a^2+1)}$ D. $\frac{4-a}{a^2+1}$

76. What is the set solution set of $\frac{2}{x} - \frac{x-2}{x^2-2x} = 1 - \frac{2x-2}{3x-2}$?

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

77. What is the solution set of the inequality $\frac{1}{x} + \frac{x}{x+1} \geq 1$?

A. $(-1, 0)$ B. $(-\infty, -1) \cup (0, \infty)$ C. $(-\infty, -1] \cup [0, \infty)$ D. $\Re \setminus \{0, -1\}$

78. The solution set of the equation $\frac{|x+1|}{|x|} = 4$ is:

A. $\left\{-\frac{1}{5}, \frac{1}{4}\right\}$ B. $\left\{-\frac{1}{5}, \frac{1}{3}\right\}$ C. ϕ D. $\left\{\frac{1}{5}, -\frac{1}{3}\right\}$

79. If $p(x) = 3x^2$ and $q(x) = x^2 + x$, then what is the solution set of $\frac{p(x)}{3q(x)} - \frac{1}{x} = \frac{1}{q(x)}$?

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

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A. A polynomial can have infinitely many vertical asymptotes.
B. The graph of a rational function can never cross its horizontal asymptote.
C. The graph of $f(x)=\dfrac{3x-1}{x-1}$ has no horizontal asymptote.
D. The graph of $f(x)=\dfrac{x^3-x}{x^2-x}$ has no vertical asymptote.

81. Which one of the following is **true** about the graph of $f(x)=\dfrac{x^2-1}{x-x^2}$?

A. $x=0$ and $x=1$ are its vertical asymptotes.
B. $y=1$ is its horizontal asymptote.
C. $y=x-1$ is its oblique asymptote.
D. It is almost the same as the horizontal line $y=-1$ as $x\to\pm\infty$.

82. What is the solution set of $\dfrac{1-\dfrac{1}{x}}{1-\dfrac{1}{x^2}}=3x^2-\dfrac{x}{1+\dfrac{1}{x}}$?

A. $\left\{-1,\ \dfrac{1}{3}\right\}$ B. $\left\{\dfrac{1}{3}\right\}$ C. $\left\{3,\ -\dfrac{1}{3}\right\}$ D. $\left\{-\dfrac{1}{3}\right\}$

83. The value(s) of x where the graph of the function $y=\dfrac{x^2-1}{x^3}$ crosses its horizontal asymptote is (are):

A. $x=-2$
B. $x=-1$ and $x=1$
C. $x=0$
D. $x=-\sqrt{2}$ and $x=1+\sqrt{2}$

84. Which of the following expressions is equal to $\left(\dfrac{1}{x}-\dfrac{x+1}{x-1}\right)\div\dfrac{\dfrac{1}{x}+x}{x^3-x^2}$ for $x\neq 0,\ 1,\ -1$?

A. $\dfrac{(x^2+2x-1)x^3}{1+x^2}$ B. $-x^2$ C. $-(x^2+1)^2$ D. $\dfrac{1-x}{x+1}$

85. Which one of the following is **true** about the horizontal asymptote(s) of the graph of $y=\dfrac{|x|+2}{x}$?

A. $y=2$ is the only horizontal asymptote of the graph.
B. $y=1$ and $y=-1$ are the only horizontal asymptotes of the graph.
C. $y=2$ and $y=-2$ are the only horizontal asymptotes of the graph.
D. $y=1$ is the only horizontal asymptote of the graph.

86. Suppose $f(x)=\dfrac{Q(x)}{x(x^2-1)}$ where $Q(x)$ is a quadratic function. Which one of the following is necessarily true about the graph of f?

A. $x=0$, $x=1$ and $x=-1$ are vertical asymptotes of the graph of f.
B. The graph of f does not intersect with its horizontal asymptote.
C. The vertical asymptote of the graph of f is only $x=-1$ if $Q(x)=x^2-x$.
D. The vertical asymptote of the graph of f is only $x=1$ if $Q(x)=2x^2$.

87. Which of the following is the solution set of the equation $\dfrac{x+1}{x-3}-\dfrac{x-2}{x+3}-\dfrac{3(3x-1)}{(x-3)(x+3)}=0$?

A. ϕ B. $\{0\}$ C. $\{x : x \text{ is real and } x\neq 3,-3\}$ D. $\{1\}$

88. What is the domain of the expression $\dfrac{1}{\sqrt{1-x}}$?

A. $\Re\setminus\{1\}$ B. $[1,\ \infty)$ C. $(-\infty,\ 1]$ D. $(-\infty,\ 1)$

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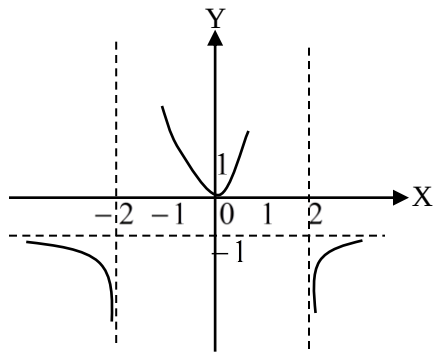
a89. Which of the following function best describes the graph given below?

A. $f(x)=\dfrac{x-1}{(x+2)(x-2)}$

B. $f(x)=\dfrac{x^2-1}{(x+2)(x-2)}$

C. $f(x)=\dfrac{(x-1)^2}{(x+2)(2-x)}$

D. $f(x)=\dfrac{(1-x)^2}{(x+2)(x-2)}$



90. If $x=2$ and $y=\dfrac{1}{3}$, then $\dfrac{\frac{1}{x}-\frac{1}{y}}{1-\frac{y}{x}}\div\dfrac{1}{\frac{1}{y}-\frac{3y}{x}}$ is equal to:

A. -1 B. $-\dfrac{6}{5}$ C. $-\dfrac{15}{2}$ D. $\dfrac{6}{5}$

91. Let $f(x)=x+1+\dfrac{x-1}{x}$. Then which of the following is **NOT** true?

A. The line $y=x+1$ is an oblique asymptote to the graph of f.

B. $-1-\sqrt{2}$ is an $x-$intercept of the graph of f.

C. The graph of the function f does not have a $y-$intercept.

D. $-1+\sqrt{2}$ is an $x-$intercept of the graph of f.

92. If $a\neq 0$ and $a\neq b$, what should be the value of k be, so that the expressions $\dfrac{2(b-a)}{a^2+ab+b^2}$ and $\dfrac{k}{a^4-ab^3}$ are equal?

A. $-2(a-b)^2$ B. $2(a-b)^2$ C. $2a(a-b)^2$ D. $-2a(a-b)^2$

93. The simplest form of $\dfrac{1+\frac{1}{x}}{x-\frac{1}{x}}$ when $x\neq 0, 1$ is:

A. $-\dfrac{1}{x+1}$ B. $\dfrac{1}{x+1}$ C. $\dfrac{1}{1-x}$ D. $\dfrac{1}{x-1}$

94. The simplified form of $\left(\dfrac{x}{y}-\dfrac{y}{x}\right)-2z=\left(\dfrac{x}{y}+\dfrac{y}{x}\right)z$ is solved for z, provided that $xy\neq 0$, then z is equal to:

A $\dfrac{-2(x-y)}{x}$ B. $\dfrac{-y-y}{x-y}$ C. $\dfrac{x-y}{x+y}$ D. $\dfrac{x+y}{x-y}$

95. For $a\neq\pm b$, $\dfrac{a+b}{a-b}+\dfrac{a}{b-a}-\dfrac{2ab}{a^2-b^2}$ is equal to:

A. $\dfrac{-b}{a+b}$ B. $\dfrac{b}{a+b}$ C. $\dfrac{-b}{a-b}$ D. $\dfrac{b}{a-b}$

96. For $x>0$ and $x\neq 3$ the product $\left(\dfrac{x^{\frac{5}{2}}+81x^{-\frac{3}{2}}}{x+3}\right)\left(\dfrac{x^{\frac{3}{2}}}{x+3}\right)$ is equal to:

A. x^2-3 B. x^2+9 C. x^2+27 D. x^2-81

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97. Which of the following expressions define a rational function?

A. $\sqrt{\frac{x+1}{x-1}}$ B. $\frac{1}{\log_2 x}$ C. $2x^{-3}+3x^{-2}+5$ D. $\frac{3^x+1}{x^2+1}$

98. If $f(x)=\frac{2x+1}{(x-2)^2(x+1)^2}$, then which of the following is **true** about f ?

A.As $x\to 2^-$, $f(x)\to -\infty$

B. The graph of $f(x)$ doesn't meet any of its asymptote.

C.As $x\to -1^+$, $f(x)\to -\infty$

D. The graph of $f(x)$ has oblique asymptote.

99. Functions f and g are defined on suitable conditions by $f(x)=\sin x$ and $g(x)=\frac{\pi}{x}-\frac{\pi}{3}$. Then the value of $f(g(-3))$ is equal to:

A. $\frac{\sqrt{3}}{2}$ B. $\frac{1}{2}$ C. $\frac{1}{2}-\frac{\pi}{3}$ D. 0

100. If $f(x)=\frac{3x^2}{(x-2)(x+1)}$, then which of the following is **true** about f ?

A. The graph of f does not cross its horizontal asymptote. C. As $x\to\infty$, $f(x)\to 0$

B. $f(x)<0$ for $x<0$ D. $f(x)>0$ for $x\in(-\infty,-1)\cup(2,\infty)$

101. What are the respective values of *A*, *B* and *C*, so that $\frac{6x^2-14x-27}{(x+2)(x-3)^2}=\frac{A}{x+2}+\frac{B}{x-3}+\frac{C}{(x-3)^2}$?

A. 1, 5 and -3 B. -3, 5 and 1 C. -1, 5 and 3 D. 5, -1 and 3

102. Which of the following is a simplified form of $\frac{x^2-x-6}{3x^2-12}\div\frac{x^2-3x}{2-x}$?

A. $\frac{1}{3-x}$ B. $-\frac{x}{3}$ C. $-\frac{1}{3+x}$ D. $-\frac{1}{3x}$

103. Which of the following is not a rational expression?

A. $\frac{\pi+\sqrt{\pi}}{\pi-1}$ B. $\frac{x\sqrt{x}+1}{x+5}$ C. $\frac{1+x\sqrt{3}+ex^2}{2+x^2}$ D. $x^{-2}+x^{-1}+x+1$

104. The simplest form of $\frac{\frac{1}{x^2}-\frac{1}{y^2}}{\frac{1}{x}-\frac{1}{y}}$ is

A. $\frac{x+y}{x-y}$ B. $\frac{xy}{x+y}$ C. $\frac{x+y}{xy}$ D. $\frac{x-y}{x+y}$

105. If $f(x)=\frac{2x+1}{3x-1}$ and $f(a)=4$,then what is $f(2a)$?

A. $\frac{3}{2}$ B. $\frac{2}{3}$ C. $\frac{5}{2}$ D. $\frac{-3}{2}$

106. The ratio of Male students to Female students is 5:3. If the number of Male students 24 more $\frac{2}{3}$ of Female, How many Female and Male students are their in a certain class?

A.F = 40, M = 24 B.F = 24 , M = 40 C.F = 30, M = 46 D.F = 46, M = 30

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107. Let $f(x)=x+1+\frac{x-1}{x}$. Then which of the following is **NOT** true?

A. The line $y=x+1$ is an oblique asymptote to the graph of f.

B. $-1-\sqrt{2}$ is an $x-$intercept of the graph of f.

C. The graph of the function f does not have a $y-$intercept.

D. $-1+\sqrt{2}$ is an $x-$intercept of the graph of f.

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108. Let $f(x)=\frac{1-x^2}{1+x^2}$,then which of the following is true?

A. f is decreasing function

B. The line x=-1 is a vertical asymptote

C. The range of f is the interval(-11]

D. The graph of f has no asymptote

109. Let $f(x)=\frac{1-x}{1+x}$,then $f\left(f\left(\frac{\sqrt{x^2+1}}{x+5}\right)\right)$ is equal to

A. $\frac{x+5}{x^2+1}$ B. $\frac{\sqrt{x^2+1}}{x+5}$ C. $\sqrt{\frac{x^2+1}{x+5}}$ D. $\sqrt{\frac{x+5}{x^2+1}}$

110. The solution of the equation $\frac{x}{x+1}-\frac{x+1}{x+2}=\frac{x-3}{x^2+3x+2}$ is;

1. {3} B.{2} C.{-1} D.{1}

111. If (1,5) and $(\frac{-1}{2},\frac{-1}{2})$ are the points on the graph of the function $f(x)=\frac{ax^2+x+2}{2x+b}$,then what is value of a and b respectively?

A. $\frac{6}{7},\frac{11}{7}$ B. $\frac{-6}{7},\frac{11}{7}$ C. $\frac{-6}{7},\frac{-11}{7}$ D. $\frac{6}{7},\frac{-11}{7}$

112. Let $f(x)=\frac{x^2-x-2}{x^2-1}$,then which one of the following is not true about the graph of f?

A. It cuts the y-axis at (0,2)

B. It has hole at x=-1

C. It cuts the x-axis at (-2,0)

D. The line y=1 is the horizontal asymptote.

113. What is the solution set of the inequality $\frac{x^2-3x+2}{4x^2-4x+1}>0$?

A. $(-\infty,1)\cup(2,\infty)$ B. $(-\infty,\frac{1}{2})\cup(1,2)$ C. $(-\infty,\frac{1}{2})\cup(2,\infty)$ D. $(-\infty,\frac{1}{2})\cup(\frac{1}{2},1)\cup(2,\infty)$

114. $4-\frac{1}{2-\frac{1}{1-\frac{x-1}{x+1}}}$ when simplified gives

A. $\frac{4x+10}{x+3}$ B. $\frac{4x-10}{x-3}$ C. $\frac{4x-10}{x+3}$ D. $\frac{4x+10}{x-3}$

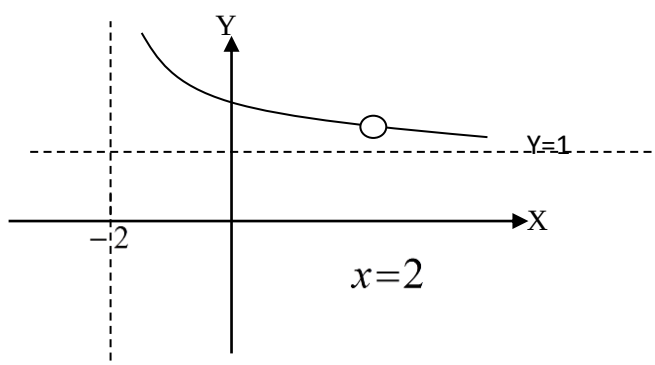
115. Which of the following functions could most likely be drawn as in the figure below?

A. $f(x)=\frac{x+3}{x+2}$

B. $f(x)=\frac{x^2-2x}{x^2-4}$

C. $f(x)=\frac{-x^2-x+6}{x^2-6}$

D. $\frac{x^2+x-6}{x^2-4}$



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116. For $x>0$ and $x\neq 3, x\neq -3$ the product $\left(\frac{x^{\frac{5}{2}}-81x^{\frac{-3}{2}}}{x-3}\right)\left(\frac{x^{\frac{3}{2}}}{x+3}\right)$ is equal to:

A. x^2-3 B. x^2+27 C. x^2+9 D. x^2-81

117. If L is a line whose equation is $L: Ax+By+C=0$, then which of the following is **NOT** necessarily **true** about L ?

A. Its graph is straight line and every straight line is the graph of a first degree equation.
B. For $A\neq 0$ and $B\neq 0$, L is perpendicular to the line whose equation is $Ay-Bx-C=0$.
C. Its graph is rises up from left to the right.
D. If $B=0$, then L is parallel to the line $y=0$.

118. If $f(x)=x-4, g(x)=x^2+8$ and $h(x)=x^2-2x-8$, then which of the following is lowest form o $k(x)=\frac{x}{f(x)}-\frac{g(x)}{h(x)}$?

A. $\frac{2}{x+2}$ B. $\frac{x}{x-4}$ C. $\frac{8x}{x-4}$ D. $\frac{2x+8}{x^2-2x-8}$

119. Which of the following is NOT TRUE about $f(x)=\frac{1-2x^2}{x^2+4}$?

A. Range of $f=[-2,0]$
B. f has no vertical asymptote
C. $y=2$ is horizontal asymptote of f
D. Graph of f is symmetrical with respect to y-axis

UNIT THREE
COORDINATE GEOMETRE

120. Which one of the following is **NOT** true?

A. Any two points determine a straight line.
B. For p(x_1,y_1) and Q(x_2,y_2), If $x_1=x_2$, then the line is vertical.
C. If two lines l_1 and l_2 have the same slope, then the two lines are parallel.
D. If two lines l_1 and l_2 have the same slope, then the two lines are perpendicular

121. Which of the following is the equation of the line through (a,b) and perpendicular to the line through $(a,2b)$ and $(b,2a)$ for $a\neq b$

A. $2y-x=2b+a$ B. $2y-x=2b-a$ C. $y-2x=b-2a$ D. $y-2x=b+2a$

122. The straight lines $x+y=0, 3x+y-4=0, x+3y-4=0$ form a triangle which is:

A. isosceles B. equilateral C. right angled D. none of these

123. Consider circle C: $x^2+y^2+2x=8$ and line $l; 3y=x-6$ which relationship describes position of C and l?

A. L passes through center of C
B. The line cuts the circle at two points
C.L is tangent to C
D. L does not intersect C

124. Which of the following points are collinear?

A.(2,-1),(-1,-1) (2,0)
B.(-2,0),(0,2),(3,5)
C.(-1,1),(0,0),(-2,1)
D.(1,3),(1,-3),(3,3)

125. Suppose l_1 and l_2 represents two perpendicular lines in a plane .if l_1 passes through (0,4) and equation of l_2 is 2x-y-3=0,what is equation of l_1?

A. $y-4x+3=0$ B. $2y+x=8$ c. $2x+y-8=0$ D. $x-2y-4=0$

126. The distance between point (1,-1) and line $2x-y-3=0$,is

A. $\frac{\sqrt{2}}{2}$ B.0 C.-1 D. $\frac{\sqrt{2}}{4}$

127. Let $l_1; 3x+4y=9$ and $l_2: 3y-4x-1=0$ represents two intersecting lines in a plane. If α is the angle of intersection between l_1 and l_2,then what is $\tan\alpha$?

A. 45^0 B. 90^0 C. 30^0 D. 60^0

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128. For what values of k such that the points $(1,1)$, $(3,k)$ and $(k,3)$ are collinear?
A.1 B.-1 C.2 D. -2

129. The equation of the directrix line of the parabola with equation $y^2+6y-20x+49=0$ is
A. $y=3$ B. $x=7$ C. $y=3$ D. $x=-3$

130. Given three points $A(1,0), B(-3,0)$ *and* $C(1,2)$, then the equation of the line through A and perpendicular to $\overline{BC}$ is:
A. $y=-2x$ B. $y=-2x+1$ C. $2x+y=2$ D. $x-2y=1$

131. If the line $y=kx+9$ passes through the point of intersection of the lines $x-y+5=0$ and $x+2y+2=0$ then k is equal to
A. $k=-2$ B. $k=2$ c. $k=4$ D. $k=-4$

132. What is the equation of a line passing through the mid-point of line segment with end point $(-1,3)$ and $(3,1)$,and perpendicular to the line whose angle of inclination is double angle of inclination of the line $2x+y=7$?
A. $2y-x=3$ B. $4x+3y=10$ C. $4y-5x=3$ D. $4y+3x=11$

133. Suppose that a triangle has vertices $A=(1,2), B=(3,4)$ *and* $C=(2,5)$ a plane. What is the degree measure of interior angle of the triangle at vertex B?
$A.30^0$ $B.45^0$ $C.90^0$ $D.60^0$

134. Which one of the following is an equation of a bisector of an angle between the line $x+y=5$ and $x-y=1$?
A. $y=3$ B. $x=2$ C. $x+y=2$ D. $y=2$

135. The equation $y^2-x^2+2x-1=0$ represents:
A. a pair of straight lines
B. a circle
C. a parabola
D. an ellipse

136. The two circles $x^2+y^2-2x-3=0$ and $x^2+y^2-4x-6y-8=0$ are such that
A. they touch each other
B. they intersect each other
C. one lies inside the other
D. each lies outside the other

137. A circle of radius 1 unit is internally tangent to the circle $x^2+y^2-2y=8$ at $(3,1)$, then the equation of the smaller circle is:
A. $x^2+(y-1)^2=1$
B. $(x-1)^2+(y-2)^2=1$
C. $(x-4)^2+(y-2)^2=1$
D. $(x-2)^2+(y-1)^2=1$

138. What is the equation of tangent line to the circle $x^2+y^2+4x-6y-12=0$?
A. $3x+4y-31=0$
B. $3x-4y-31=0$
C. $3x-4y+31=0$
D. $x-y-31=0$

139. What is the focus of the parabola $y^2+8x+6y+25=0$?
A. $(-2,-3)$ B. $(-4,-3)$ C. $\left(-1,\frac{7}{5}\right)$ D. $\left(-\frac{7}{5},0\right)$

140. The equation $4x^2+12xy+9y^2-52x+26y-81=0$ represents:
A. A hyperbola B. Two intersecting lines C. A parabola D. An ellipse

141. Consider circle $x^2+2x+y^2=8$ and line $3y=x-6$. Which relationship describes position of the circle and the line?
A. The line does not intersect the circle
B. The line passes through the center of the circle
C. The line cuts the circle at two points
D. The line is tangent to the circle.

142. This of the following is TRUE about the ellipse whose equation is given by $4x^2+y^2=16$?
A. The length of the minor axis is 2
B. The length of the major axis is 16
C. The foci are (0,-2) and (0, 2)
D. (0, -4) and (0, 4) are the vertices

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143. What is the equation of a circle tangent to the line 3y-4x=5 and with center (2,1)?

A. $x^2+y^2+4x+2y=16$ B. $x^2-2x+y^2+2y=1$

C. $(x-2)^2+(y-1)^2$ D. $\left(x-\frac{2}{5}\right)^2+\left(y-\frac{11}{5}\right)^2$

144. What is the equation of parabola with vertex (-2,5) and Focus (-2,-7)?A. $(x+2)^2=-48(y-5)$

B. $(x+2)^2=48(y-5)$ C. $(y-5)^2=-48(x+2)$ D. $(y-5)^2=48(x+2)$

145. The shortest distance from appoint out side a circle to appoint to on a circle of radius 3cm is 2cm.then the longest distance of this point on the circle is A.5cm B.3cm C.4cm D. 2cm

146. Consider circle $x^2-2x+y^2+4y=35$ and line $3y=15-x$. Which relationship describes position of the circle and the line?

A. The line does not intersect the circle B. The line passes through the center of the circle

C. The line cuts the circle at two points D. The line is tangent to the circle.

147. The two circles $x^2+y^2-6x-2y-15=0$ and $x^2+y^2+2x+4y+4=0$ are such that

A. they touch each other B. they intersect each other

C. one lies inside the other D. each lies outside the other

148. Which of the following is true about the point p(3,2) and the circle $x^2+y^2-8x+4y=0$?

A. Point p(3,2) is on the circle B. Point p(3,2) in side of the circle

C.. Point p(3,2) out side of the circle D. Point p(3,2) has no any relation with the circle

149. Which of the following lines are not perpendicular lines?

A. $x+y-3=0\,\&\; y-x+2$ B. $y-ax+5=0\,\&\; ay+x-7=0$

C. $2x-y-2=0\,\&\; 2x+4y+18=0$ D. $2x-y-3=0\,\&\; y-2x-5=0$

150. The angle between two lines is 45^0 and the slope of one of the line is $\frac{2}{3}$.What is the slope of the other line?

A. $\frac{1}{5}$ B. $\frac{-1}{5}$ C. $\frac{-3}{2}$ D. $\frac{-1}{2}$

151. The intersection of the circle with equation $(x-1)^2+(y-2)^2=25$ and line with equation $x=-2$ is

A. $(-2,-2)\,\&\,(-2,6)$ B. $(2,2)\,\&\,(2,6)$ C. $(-2,2)\,\&\,(2,6)$ D. $(2,-2)\,\&\,(-2,6)$

152. Let the equation $x^2+y^2+2x-8=0$ represents a circle. Then which of the following lines cut the circle at exactly two points?

A. $4y+3x=-14$ B. $y-2x=50$ C. $2y-5x=43$ D. $3y+4x=-19$

153. The equation of the line L that passes through (1,-4) and perpendicular to $x+5y-3=0$ is

A. $y+5x+9=0$ B. $y-5x+9=0$ C. $5y+x-9=0$ D. $5y+x+9=0$

154. Which of the following equation is not represent a circle?

A. $x^2+y^2-6x-10y+16=0$ B. $x^2+y^2+2x-10y=0$

C. $x^2+y^2-x+y=0$ D. $x^2+y^2+2x+6y+12=0$

155. Which conic section is represented by $2x^2+3y^2+20x-24y+74=0$

A. Parabola B. Ellipse C. Circle D. Hyperbola

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156. The equation of a line passing through origin and tangent to a circle $x^2+y^2-2x-4y=0$ is

A. $y=\frac{1}{2}x$ B. $y=\frac{-1}{2}x$ C. $y=2x+1$ D. $y=2x-1$

157. The distance between the line $3y+2x-5=0$ and $6y+4x-1=0$ is

A. $\frac{9\sqrt{13}}{13}$ B. $\frac{5\sqrt{13}}{13}$ C. $\frac{3\sqrt{3}}{2}$ D. $\frac{9}{\sqrt{52}}$

158. The equation of the ellipse with center at $(1,4)$,vertices at $(10,4)$ and $(1,2)$ is

A. $(x-10^2+9(y-4)^2=4$ B. $4(x-1)^2+81(y-4)^2=324$

C.9 $(x-1)^2+4(y-4)^2=1$ D. $2(x-1)^2+9(y-4)^2=4$

159. The equation of parabola satisfying $v(-3,2)$ and directrix: x=1 is

A. $(y-2)^2=-4(x+3)$ B. $(x-2)^2=-16(y+3)$

C. $(y-2)^2=-16(x+3)$ D. $(x-2)^2=-4(y+3)$

160. The intersection point of the circle with equation $(x-1)^2+(y+1)^2=25$ with the line $4x-3y-7=0$ is

A. $p(-2,-5)$ B. $p(2,5)$ C. $p(-4,-3)$ D. $p(4,3)$

161. Let the equation of the circle is $x^2+y^2+2x-4y-5=0$,Then what is the equation of tangent line at point (1,5) on the circle?

A. $2x+y=11$ B. $x+2y=11$ C. $2x+2y=11$ D. $x+y=11$

162. The standard form the equation of a circle with Centre $(-2,3)$ and tangent to the x-axis is

A. $(x-3)^2+(y-4)^2=9$ B. $(x+2)^2+(y-3)^2=9$

C. $(x+3)^2+(y+4)^2=9$ D. $(x-2)^2+(y+3)^2=9$

163. Let $x^2+y^2+kx=1$ be equation of a circle for some $k\in R$ .what is the radius of the circle if its center is $(2,0)$?

A. $\sqrt{5}$ B. 2 C. $\sqrt{2}$ D. 5

164. The line through $(-2,3)$ and $(2,a)$ is perpendicular to the line through $(2,5)$ and $(1,7)$,then what is value of a?

A.4 B.5 C.2 D.3

165. What is the point on the parabola $y^2=16x$ whose distance from the focus is 13?

A. $(9,12)$ and $(9,-12)$ B. $(12,9)$ and $(12,-9)$

C. $(3,4)$ and $(3,-4)$ D. $(4,3)$ and $(4,-3)$

166. Which of the following is asymptote of the hyperbola $y^2-x^2+6x-5=0$?

A. $y=x+3$ B. $y=-x+3$ C. $y=-x-3$ D. $y=x-4$

167. Which of the following is the distance from center to one of foci of hyperbola $\frac{(y-2)^2}{20}-\frac{(x+)^2}{16}=1$?

A.5 B.10 C.6 D.8

168. What is the point on the line $y=x-2$ at a distance of $3\sqrt{2}$ units from $(1,-1)$

A. $(4,2)$ B. $(-4,-2)$ C. $(2,4)$ D. $(3,4)$

169. The general second degree equation $x^2+4xy-2y^2-6=0$ represents equation of :

A.An ellipse B. A parabola C. Hyperbola D. Circle

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170. For what value of b does the parabola $p(x)=ax^2+x+b$ pass through the points $(-2,7)$ and $(-1,2)$

A.-3 B.9 C.6 D.1

171. What is the equation of a hyperbola if the foci are $F(2,5)$ and $F'(-4,5)$ and the transverse axis is 4 units long?

A. $\frac{(x+1)^2}{4}-\frac{(y-5)^2}{5}$ B. $\frac{(y+1)^2}{4}-\frac{(x-5)^2}{5}$

C. $\frac{(x-1)^2}{4}-\frac{(y+5)^2}{5}$ D. $\frac{(x-1)^2}{4}-\frac{(y-5)^2}{5}$

172. The orbit of Mercury around the sun forms an ellipse with eccentricity of ,e=0.206 length of major axis 1.16×10^8 km and the sun at one focus .What is the best approximation of the maximum distance from mercury to the sun?

A. 7.596×10^7 km B. 5.995×10^7 km

C. 5.695×10^7 km D. 6.995×10^7 km

173. An iron wire bent in shape of parabola has latus rectum of length 60cm.What is focal length?

A.30cm B. 60cm C. 15cm D. 20cm

174. The focus and the directrix of the parabola whose equation is $(x+2)^2=4(y-6)$ respectively

A. $F(-2,7), y=3$ B. $F(-2,7), y=5$ C. $F(2,7), y=3$ D. $F(2,7), y=5$

175. Satellite moves along a hyperbolic curve whose horizontal transverse axis is 24km and asymptote $y=\frac{3}{4}x+2$,then what is the eccentricity of the hyperbola?

A. $\frac{4}{3}$ B. $\frac{3}{4}$ C. $\frac{5}{3}$ D. $\frac{3}{5}$

176. What is the equation of hyperbola ,if the length of transverse is equal to 8 and The end points of the conjugate axis is are $A(5,-5)$ and $B(5,3)$?

A $\frac{(x-5)^2}{4}-\frac{(y+1)^2}{4}=1$ B. $\frac{(x-5)^2}{16}-\frac{(y+1)^2}{16}=1$

C $\frac{(x+5)^2}{16}-\frac{(y-1)^2}{16}=1$ D. $\frac{(x+5)^2}{16}-\frac{(y+1)^2}{16}=1$

177. Which of the following is not true about the eccentricity the following conic sections?

A.e=0 represents circle B. e=1 represents ellipse or parabola

C. 0<e<1 Ellipse D. e>1 Hyperbola

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