



Bedele Ifa Boru Special Boarding Secondary School



Grade 10 Mathematics work sheet in 2017 E.C

Prepared By:

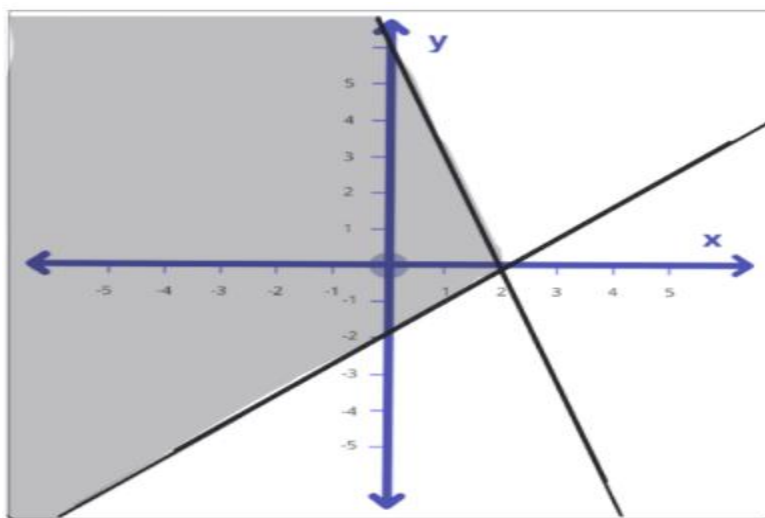
1. Kedir M.
2. Husen B.

I. Write True If The Statement Is Correct And False If The Statement Is Incorrect

1. Every onto function is bijective.
2. The relation $R = \{(x, y) : x = y^2\}$ is not function.
3. If $R = \{(x, y) : x, y \in Q, y = -3x + 5 \text{ and } x \leq 3\}$, then $(2, -1) \in R$.
4. $f: R \rightarrow R$ defined by $f(x) = |x + 3|$ is one to one function.

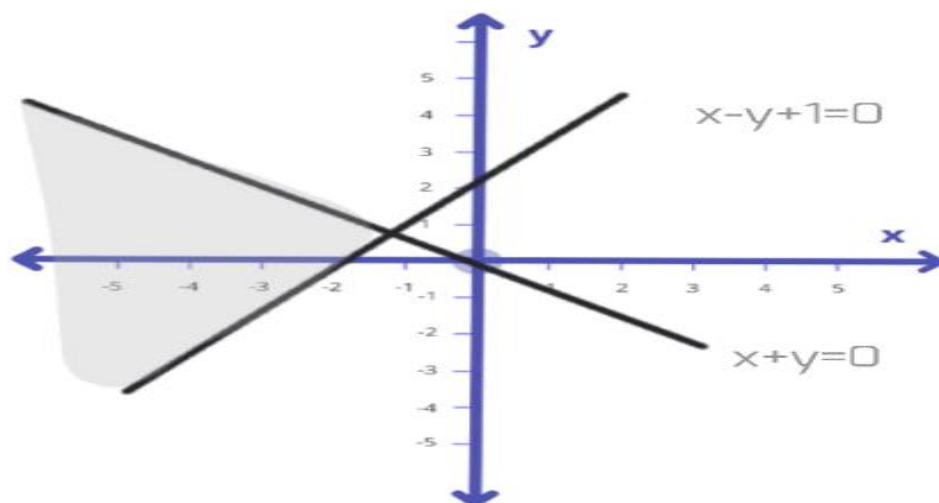
II. Choose the best answers from the given alternatives

5. Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 6, 8, 10\}$ and R be a relation defined on a set A to B such that $R = \{(x, y) : y = 2x - 6 \text{ and } x \in A \text{ and } y \in B\}$ which one is true
A. $(4, 8) \in R$ B. $(1, 2) \in R$ C. $(4, 2) \in R$ D. All are members of R
6. Let a relation $R = \{(x, y) : Y \geq -3x + 8, y \leq 2x + 4 \text{ and } x, y \in R\}$ which one of the following is true concerning this relation?
A. $D_R = \{x : x \in R \text{ and } x \geq 4\}$ B. $R_R = \{y : y \in R \text{ and } y \geq \frac{28}{5}\}$
C. $D_R = \{x : x \in R \text{ and } x \geq \frac{4}{5}\}$ D. $R_R = \{y : y \in R \text{ and } y > \frac{28}{5}\}$
7. Which one of the following function is onto from R to R ?
A. $f(x) = 2x - 3x^2$ B. $g(x) = 5x^3 + 1$ C. $f(x) = |x + 2|$ D. $\sqrt{(x^2 + 1)}$
8. The graph of a certain relation R represented by the shaded shown below. Which one of the following pair of set respectively gives the domain and range of this relation?



- A. $\{x : x \leq 2\} \& \{y : y \leq 6\}$ B. $\{x : x \leq 2\} \& R$ C. $R \& R$ D. $R \& \{y : y \leq 6\}$
9. If the 6th term of an arithmetic pattern is 15 & the difference of each consecutive term is 7 then the 8th term? A. 36 B. 29 C. 22 D. 8
 10. If the second term of geometric pattern is 32 and the ratio of each the consecutive highest to lowest is $\frac{1}{4}$, then what is the 1st term? A. 8 B. 64 C. 96 D. 48

11. Let 384, 96, $-8, 2$ is geometric pattern then the missing term is: A. 48 B. 24 C. 32 D. None
12. If the 5th term of a geometric pattern is three times the 4th term then what is the consecutive term? A. $\frac{1}{3}$ B. 3 C. 9 D. $\frac{1}{9}$
13. Let a relation $R = \{(x, y): x \text{ is more affluent than } y\}$ which one of the following is true concerning this relation?
 A. (x, x) is belongs to R B. If (x, y) belongs to R , then (y, x) is also belongs to R
 C. If (x, y) and (y, z) is belongs to R , then (x, z) is belong to R D. All are correct
14. The range of a relation $R = \{(x, y): y = 2 - |x|\}$ is
 A. $\{y: y \in \mathbb{R}\}$ B. $\{y: y \geq 2\}$ C. $\{y: y \geq 0\}$ D. $\{y: y \leq 2\}$
15. Let $f(x) = \frac{3x+5}{2x+2}$ and $g(x) = \sqrt{2x-2}$ which one of the following is necessarily true?
 A. $\text{Dom}(f+g)(x)$ is a set of real numbers C. $\text{Dom}(f+g)(x) = \{x: x \in \mathbb{R} \text{ and } x \geq 1\}$
 B. $\text{Dom}(f+g)(x)$ is set of natural numbers D. $\text{Dom}(f+g)(x) = \{x: x \in \mathbb{Z} \text{ and } x \geq 1\}$
16. From the above question number 8 the value of $\left(\frac{f}{g}\right)(9)$ is equal to A. $\frac{32}{20}$ B. $\frac{1}{8}$ C. $\frac{1}{5}$ D. $\frac{1}{6}$
17. The shaded region below is a graph of a relation R . which one of the following is represent the relation?



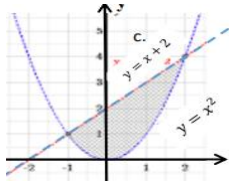
- A. $R = \{(x, y): y \leq x + 1 \text{ \& } y \geq -x\}$ B. $R = \{(x, y): y \geq x + 1 \text{ \& } y \leq -x\}$
- C. $R = \{(x, y): y \leq x + 1 \text{ \& } y \leq -x\}$ D. $R = \{(x, y): y \leq x + 1 \text{ \& } y \leq -x\}$
18. Which of the following is not functions? A. $f = \{(x, y): y \text{ is a father of } x\}$
 B. $\{(x, y): y = x^2\}$ C. $\{(x, y): x = y^2\}$ D. $\{(x, y): y = \sqrt{x+2}\}$
19. The domain of $f(x) = \sqrt{3-x}$ is A. $\{x: x \geq 3\}$ B. $\{x: x \leq 3\}$ C. $\{x: x \geq 0\}$ D. $\{x: x \in \mathbb{R}\}$
20. For two functions $f = \{(1, -2), (2, 5), (3, 1)\}$ and $g = \{(1, 0), (2, 4), (3, 2)\}$ then
 $\left(\frac{f}{g}\right)(3)$ is equal to A. $\frac{4}{5}$ B. $\frac{5}{4}$ C. $\frac{1}{2}$ D. 2

21. The domain of $\sqrt{2-x} + \sqrt{x-2}$ is
 A. $\{x: -2 \leq x \leq 2\}$ B. $\{x: x = 2\}$ C. $\{x: x \leq 2\}$ D. $\{x: x \geq 2\}$
22. Let f and g be two functions defined by $f(x) = \begin{cases} \sqrt{3x+3} & \text{for } x \leq 5 \\ 5x+3 & \text{for } x > 5 \end{cases}$
 and $g(x) = \begin{cases} 3+|x| & \text{for } x > 3 \\ x-7 & \text{for } x \leq 3 \end{cases}$ then $(f+g)(2) = ______$ A.-1 B. 1 C.18 D.9
23. Which of the following are not linear functions? A. $f(x) = 5x - 3x - 4$ B. $f(x) = 2x^2 + 1$
 C. $f(x) = 4x + 20x + 5$ D. $f(x) = 6x + 3x - 2$
24. The x-intercept, y-intercept and slope of $3x + y = 6$ respectively are
 A. 2,6,-3 B.1/2,6,3 C.-2,-6,-3 D.-1/2,6,-3
25. Which one is false about $f(x) = -5x^2 - 10x + 3$?
 A. vertex is (1, 8) B. axis of symmetry is $x=-1$ C. maximum value is $y=8$ D. range is $\{y: y \leq 8\}$
26. If $f(x) = x$ and $g(x) = \frac{1}{x}$ which of the following is not true? A. $(f-g)(1) = 0$
 B. $(fg)(1) = 1$ C. $(f \div g)(1) = 1$ D. $(fg)(-1) = -1$ E. none
27. If a line with x-intercept 4 and y- intercept -6 is given, then its slope is equal to
 A. -3/2 B. -2/3 C. 3/2 D. 2/3
28. If $f(x) = 10x - 3$ and $g(x) = 2 - x$, then $\left(\frac{1}{5}f + \frac{3}{2}g\right)(x)$ is equal to
 A. $x + \frac{12}{5}$ B. $\frac{x}{2} + 5$ C. $\frac{5x+24}{10}$ D. $\frac{5x+12}{5}$
29. Given the functions $f = \{(1,0), (-1,2), (3,4), (2,1)\}$ and $g = \{(0,0), (2,3), (3,-1), (1,-1)\}$
 Which one of the following is correct?
 A. $(f \cdot g)(2) = -1$ B. $(f - g)(3) = 5$ C. $2f(2) = 2g(1)$ D. $(f + g)(-1) = 1$
30. Let $A = \{-1, 0, 1\}$. A relation R on set A is defined by
 $R = \{(x, y): y < x, \text{ where } x, y \in A\}$. Which one of the following sets is equal to R ?
 A. $\{(0, -1), (1, -1)\}$ B. $\{(0, -1), (-1, 0), (0, 1)\}$ C. $\{(0, -1), (1, -1), (1, 0), (1, 1)\}$ D. $\{(0, -1)\}$
31. On the coordinate plane if $P(x_1, y_1)$ and $Q(x_2, y_2)$ are distinct points on a certain straight line, then which one of the following is true about the gradient (slope) of the line?
 A. If $x_1 = x_2$, then the gradient of the line is 1. B. If $y_1 = y_2$ then the line has no gradient.
 C. If $x_1 = x_2$, then the gradient of the line is 0. D. If $y_1 = y_2$, then the gradient of the line is 0.
32. Based on question number 26 the relation is specified as _____
 A. $R = \{(x, y): y \leq \frac{1}{3}x + 2, y \leq \frac{-2}{3}x + 1 \text{ and } y \leq -2x + 2 \text{ And } x, y \in R\}$.
 B. $R = \{(x, y): y \geq \frac{1}{2}x + 2, y \geq \frac{-1}{2}x + 2 \text{ and } y \leq \frac{-3x}{2} + 2 \text{ \& } x, y \in R\}$
 C. $R = \{(x, y): y \leq \frac{1}{3}x + 2, y \geq \frac{-2}{3}x + 1 \text{ and } y \geq -2x + 2 \text{ And } x, y \in R\}$.

- D. $R = \{(x, y): y \leq \frac{1}{3}x + 2, y \leq \frac{-2}{3}x + 1 \text{ and } y \geq -2x + 2 \text{ And } x, y \in R\}$.
33. If a function f is given by $f(x) = \sqrt{9 - x^2}$, then the range of f is:
 A. $[0, 3]$ B. $[-3, 3]$ C. R D. $[-9, 9]$
34. If $f(x) = x^2 + 6x + 9$, then which one of the following statements is true about the graph of f ?
 A. The graph of f is symmetrical with respect to y -axis.
 B. The minimum value of this function is 9.
 C. The graph of f is open down ward. D. The range of f is $\{y \mid y \geq 0\}$.
35. The solution set of the inequality $x^2 + 7x + 12 \geq 0$ is:
 A. $\{x : x \leq 3 \text{ or } x \geq 4\}$ B. $\{x : x \leq -4 \text{ or } x \geq -3\}$
 C. $\{x : -3 \leq x \leq -4\}$ D. $\{x : 3 \leq x \leq 4\}$
36. The solution set of $|2x - 5| \geq 3$ is: A. $\{x : x \leq -1 \text{ or } x \geq 4\}$
 B. $\{x : x \leq -4 \text{ or } x \geq -1\}$ C. $\{x : 1 \leq x \leq 4\}$ D. $\{x : x \leq 1 \text{ or } x \geq 4\}$
37. If set $A = \{\frac{1}{4}, \frac{1}{2}, 2, 4\}$, then which one of the following is a function from set A onto set A ?
 A. $\{(x, y): y = 2x \& x, y \in A\}$ B. $\{(x, y): y = x^2 \& x, y \in A\}$
 C. $\{(x, y): y = \frac{1}{x} \& x, y \in A\}$ D. $\{(x, y): y \leq x \& x, y \in A\}$
38. Let $f(x) = -x^2 + 3x - 8$. Then which one of the following is true about f ?
 A. The minimum point on the graph of f is $(-23/4, 3/2)$
 B. The maximum point on the graph of f is $(3/2, -23/4)$
 C. The maximum point on the graph of f is $(-23/4, 3/2)$
 D. The minimum point on the graph of f is $(3/2, -23/4)$
39. Let $f(x) = x - 2$ and $g(x) = x^2 + 3x - 7$ be two functions. Then functional value $\left(\frac{g}{f}\right)(-1)$ is: A. $1/3$ B. -3 C. $-1/3$ D. 3
40. Let A and B be non-empty sets. If R is a relation from A to B , then which one of the following is NOT always true?
 A. The range of R is a subset of B B. $R \subseteq A \times B$
 C. The domain of R is A D. R is the set of ordered pairs from A to B .
41. Let $f(x) = 2x - 2$ and $g(x) = 3/x - 1$ for $x \neq 1$. Then, $(f \cdot g)(x)$ is:
 A. $8 - 2x/x - 1$ B. 12 C. $2/2x - 3$ D. 6
42. Which one of the following is the domain of $f(x) = 3x - \sqrt{2 - x}$?

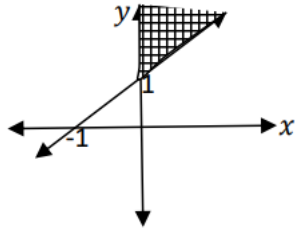
- A. $\{x \in \mathbb{R} : x \leq 2\}$ B. $\{x \in \mathbb{R} : x \geq 2\}$ C. $\{x \in \mathbb{R} : x \geq 0\}$ D. $\{x \in \mathbb{R} : x \leq 6\}$

43. Consider the graph of a relation $R = \{(x, y) : y \geq x^2 \text{ and } y < x + 2\}$ that shown below.



which one of the following is true of this relation?

- A. The domain of R is $\{x : x \in \mathbb{R} \text{ and } -1 < x < 2\}$
 B. The range of R is $\{y \in \mathbb{R} : 0 \leq y < 4\}$
 C. The domain of R is $\{x \in \mathbb{R} : 0 \leq x \leq 2\}$
 D. The range of R is $\{y \in \mathbb{R} : y > 0\}$
44. Which one of the following is true about the graph of quadratic function $f(x) = x^2 + 6x + 13$?
 A. Its y- intercept is 4. B. Its vertex is $(-3, -4)$.
 C. Its vertex is $(-3, 4)$ D. It has exactly one x-intercept
45. Let $D = \{0, 1, 2, 4\}$ and $R = \{(x, y) : x, y \in D \text{ and } y < x\}$. From the following ordered pairs which one belongs to R?
 A. $(4, 4)$ B. $(0, 4)$ C. $(1, 3)$ D. $(2, 0)$
46. Let $f(x) = x^2 + 4x + 1$. Thus the graph of f is obtained by shifting the graph of
 A. $g(x) = (x + 2)^2$ by 1 unit downward B. $g(x) = (x + 2)^2$ by 1 unit upward
 C. $g(x) = (x + 2)^2$ by 3 unit's downward D. $g(x) = (x + 2)^2$ by 1 unit upward.
47. Let $R = \{(x, y) : x, y \in \mathbb{R} \text{ and } y < 2x - x^2\}$ be a relation. What is the range of R?
 A. $\{y \in \mathbb{R} : y < 2\}$ B. $\{y \in \mathbb{R} : y > 2\}$ C. $\{y \in \mathbb{R} : y < 1\}$ D. $\{y \in \mathbb{R} : y > 1\}$
48. Let f be a function defined by $f(x) = \sqrt{x - 3}$ and is given by $f = \{(a, 1), (b, \sqrt{3}), (c, 2), (d, \sqrt{5})\}$. then what is the domain of f?
 A. $\{x \in \mathbb{R} : x \geq -1\}$ B. $\{x \in \mathbb{R} : -1 \leq x \leq 10\}$ C. $\{1, 2, 4, 5\}$ D. $\{4, 6, 7, 8\}$
49. If a function f is given by $f(x) = \sqrt{9 - x^2}$ where $x \in [-3, 3]$ then the range of f is ____
 A. $[-3, 3]$ B. $[0, 3]$ C. $[-9, 9]$ D. R
50. Which one of the following is the domain of $f(x) = -\sqrt{2 - x}$?
 A. $\{x \in \mathbb{R} : x \geq 0\}$ B. $\{x \in \mathbb{R} : x \leq 6\}$ C. $\{x \in \mathbb{R} : x \geq 2\}$ D. $\{x \in \mathbb{R} : x \leq 2\}$
51. Which of the following relations is represented by the shaded region shown on the figure below?
 A. $R = \{(x, y) : y \leq x - 1 \text{ and } x \leq 0\}$ B. $R = \{(x, y) : y \geq x + 1 \text{ and } x > 0\}$
 C. $R = \{(x, y) : y \leq x + 1 \text{ and } x \leq 0\}$ D. $R = \{(x, y) : y \geq x + 1 \text{ and } x \geq 0\}$

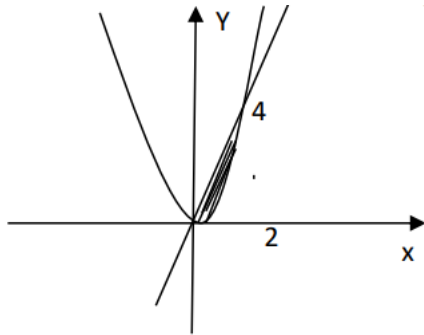


52. Given $(x) = 3(x - 2)^2 - x + 6$ and $(x) = -(2x + 3)^2 + 2x(x - 1)$, then which one of the following is NOT correct?

A. The domain of $(f \cdot g)(x)$ is the set of real numbers, $\mathbb{R}$ B. $(f \cdot g)(1) = -200$

C. $(g)(-1) = -4$ D. The degree of $(f \cdot g)(x)$ is 5

53. Consider the graph of a relation $R = \{(x, y) : y \geq x \text{ and } y \leq 2x\}$ that shown below. Then which of the following is TRUE about this relation?



A. The domain of R is $\{x \in \mathbb{R} : x \leq 2\}$ B. The range of R is

$\{y \in \mathbb{R} : y > 0\}$ C. The domain of R is $\{x \in \mathbb{R} : 0 \leq x \leq 2\}$ D. The range of R is $\{y \in \mathbb{R} : 0 < y < 4\}$

54. Which of the following relation is a function?

A. $\{(x, y) | y \text{ is a natural number and } x \text{ is a prime factor of } y\}$

B. $\{(x, y) | y \text{ is a father of } x\}$ C. $\{(-2, -8), (-8, -2), (-2, \frac{1}{2}), (2, \sqrt[3]{2}), (-1, 1)\}$ D. $\{(x, y) : x^2 + y^2 = 4\}$

55. If $f(x) = 3x - 3$ and $g(x) = 2 - 3x$, then $(2f + 3g)(x)$ is equal to:-

A. $-9x^2 + 15x - 6$ B. $-x$ C. $12x + 6$ D. $-6x + 5$

56. If $(x) = \sqrt{x} + 2$, and $(x) = \frac{1}{\sqrt[3]{x}}$, then which one of the following is true?

A. $(p \cdot q)(1) = 3$ B. $(p \cdot q)(4) = 2$ C. $(p \cdot q)(-1) = -3$ D. $(p \cdot q)(0) = 2$

57. The domain of the function $f(x) = \sqrt{x - 1} + \frac{1}{x + 1}$ is

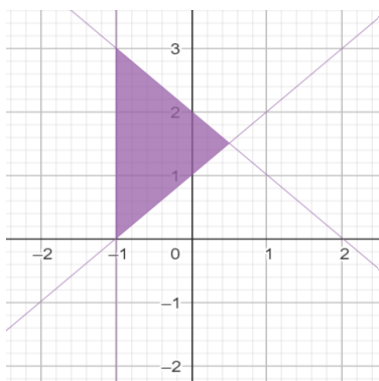
A. $\mathbb{R}$ B. $(-1, \infty)$ C. $(1, \infty)$ D. $(-\infty, 1) \cup (1, \infty)$

58. If $f = \{(1, 3), (2, 4), (8, 9)\}$ and $g = \{(1, 4), (2, 0), (3, 5)\}$, then $f + g$ is given by

A. $= \{(2, 7), (4, 4), (11, 14)\}$ B. $= \{(1, 7), (2, 4), (8, 9), (3, 5)\}$

C. $= \{(1, 7), (2, 4)\}$ D. $= \{(1, 7), (2, 4), (8, 14)\}$

59. A manufacturer estimated that the total cost (C in birr) of operating a factory is $C(x) = 0.5x^2 - 20x + 500$. What is the minimum possible cost of operating the factory?
 A. 500Birr B. 5200Birr C. 4600Birr D. 4800Birr
60. Which one of the following is true about the function $f(x) = ax^2 + c$ for $a \neq 0$?
 A. the range is $\{y: y \geq 0 \text{ for } a > 0\}$ B. the range is $\{y: y \leq 0 \text{ for } a > 0\}$ C. . the range is $\{y: y \geq C \text{ for } a > 0\}$ D. . the range is $\{y: y \geq C \text{ for } a < 0\}$
61. Which of the following defines a function?
 A. $\{(x, y): x \text{ is area of triangle } y\}$ B. $\{(x, y): y = \frac{1}{\sqrt{x}}\}$ C. $\{(x, y): x^2 + y^2 = 1\}$ D. $\{(x, y): y > x\}$
62. If $f(x) = x^2 - 3x + 2$ and $g(x) = x - 2$, then the domain of $\left(\frac{f}{g}\right)(x)$ is
 A. $R \setminus \{2, 1\}$ B. $R \setminus \{1\}$ C. $\{-1, -2\}$ D. R
63. Which one of the graphs given below is not one to one correspondence function $f: R \rightarrow R$?
 A. $f(x) = x^2, x > 0$ B. $f(x) = x^2, x > 0$ C. $f(x) = x^5, x > 0$ D. $f(x) = \frac{1}{x}, x > 0$
64. If $f(x) = \frac{1}{x}$ and $g(x) = \sqrt{4 - x^2}$, then which one of the following is the domain of $\frac{g}{f}$?
 A. $(-2, 2)$ B. $[-2, 2]$ C. $R \setminus \{0\}$ D. $[-2, 0) \cup (0, 2]$
65. If R is a relation whose graph is given as below. Which one of the following is the domain of R?



- A. $\{x; x \in R \text{ and } -1 \leq x \leq \frac{3}{2}\}$ B. $\{x; x \in R \text{ and } 0 \leq x \leq 6\}$
 C. $\{x; x \in R \text{ and } -\frac{3}{2} \leq x \leq \frac{1}{2}\}$ D. $\{x; x \in R \text{ and } -1 \leq x \leq \frac{1}{2}\}$

66. Which one of the following is the domain of $R\{(x, y): y \geq 6 + \frac{3}{2}x \text{ and } y < 3 - 3x\}$?

- A. $(\infty, \frac{-2}{3})$ B. $(-\infty, \frac{2}{3})$ C. $(-\frac{2}{3}, \infty)$ D. $(-\infty, -\frac{2}{3}]$

67. Which one of the following is the range of the relation R in question no 18?

- A. R B. $(0.5, \infty)$ C. $(-\infty, 0.5]$ D. $(-\infty, -0.5)$

68. If $R = \{(x, y): y > 5 - 5x \text{ and } y > 3x + 1\}$, then which one of the following is true?

- A. Domain of $R[\frac{1}{2}, \infty)$ B. Range of $R = (-\infty, \infty)$
C. Domain of $R = (-\frac{1}{2}, \infty)$ D. Range of $R = (\frac{5}{2}, \infty)$

69. Which one of the following is not a function?

- A. $\{(x, y): x \text{ is your classmate and } y \text{ is his or her DNA}\}$
B. $\{(x, y): x \text{ is a student in your class and } y \text{ is his or her age}\}$
C. $\{(x, y): x \text{ is a person and } y \text{ his or her birth place}\}$
D. $\{(x, y): x \text{ is a boy and } y \text{ his parents}\}$

70. Which one of the following is not function?

- A. $\{(x, y): y = x^2\}$ B. $\{(s, t): s = t^4\}$ C. $\{(u, v): v^3 = u\}$ D. $\{(a, b): a^2 + 1 = b\}$

71. Which one of the following is not one to one function?

- A. $f(x) = 1 - x^2$ B. $f(x) = 5x - 200$ C. $f(x) = \sqrt{x}$ D. $f(x) = \frac{9}{x}$

72. Which one of the following is bijective function?

- A. $f: (-\infty, 0] \rightarrow R, f(x) = x^2$ B. $g: [0, \infty) \rightarrow R^+, g(x) = \sqrt{2 - x}$
C. $h: R \rightarrow R, h(x) = |x + 3| - 3$ D. $K: (\infty, -\frac{2}{3}) \cup (-\frac{2}{3}, \infty) \rightarrow R, k(x) = \frac{x^2 + 2}{3x + 2}$

73. Which one of the following statement is true about the function $f(x) = (x - 1)^2 + 3$

- A. It is increasing in the interval $(1, \infty)$ C. the graphs is symmetric with respect to y-axis
B. The x intercept is 1 D. the range is $[3, \infty)$

74. Let $(x) = \sqrt{3 - x}$ and $g(x) = x^2 + 2x + 1$, then which one of the following statements is correct?

- A. The domain of $(\frac{f}{g})$ is $(3, \infty)$ B. The domain of $(f + g)(x)$ is the set of real number
C. The domain of $(\frac{f}{g})$ is $(-\infty, 3]$ D. The domain of $(f + g)$ is $(-\infty, 3]$

75. If a function p is given by $(x) = (1 - 2x)^2 + 4$, then what the range of p?

- A. $(-\infty, \infty)$ B. $[8, \infty)$ C. $[4, \infty)$ D. $(-\infty, -4]$

76. The quadratic function f given by $f(x) = 2x^2 + 3x + 1$, which one of the following statements is correct about the graph of this function?
- A. It is increasing in the interval $(-\infty, -\frac{3}{4})$ C. it is symmetric about y-axis
- B. It crosses the y-axis at exactly one point D. It is increasing on the interval $[-\frac{3}{2}, \infty)$
77. Which one of the following is not true about quadratic function of $f(x) = (x - 2)^2 + 4$? A. The graph of the function is open upward parabola B. The vertex of the graph is $v(-2, 4)$ C. It is increasing in the interval of $[2, \infty)$ D. It is decreasing in the interval of $(-\infty, 2]$
78. If $h = \{(1, 2), (2, 3), (3, 5)\}$ and $g(x) = 3x^2 + 12x$. Then $(g \circ h)(3) = \underline{\hspace{2cm}}$
- A. Cannot be determined. B. 15 C. 5 D. 3
79. If $f(x) = x^2 + 6x + 9$ then which one of the following statements is true about the graph of f ? A. The minimum value of this function is 9
- B. The graph of f is a symmetrical with respect to the y-axis
- C. The range of f is $\{y/y \geq 0\}$ D. The graph of f is open down ward.
80. Which one of the following is true about the graph of a quadratic function of $f(x) = -ax^2 + bx + c$?
- A. It has exactly two zeros. B. It has exactly one x intercept.
- C. It has exactly one y-intercept D. It is increasing
81. The graphs of quadratic function given by $f(x) = ax^2 + b$ lies above x-axis, whenever
- A. Both a and b are positive B. a and b has opposite in sign ax^2
- C. a is greater than b D. both a and b are negative
82. Which one of the following is TRUE about the graphs of the function of $f(x) = -(x - 4)^2 - 3$ A. The vertex of the function is $(4, 3)$
- B. The range of f is $\{y : y \leq 3\}$
- C. The graph is decrease in the interval of $(-\infty, 4]$
- D. The graph is increase in the interval of $[4, \infty)$
83. Given a function $f(x) = ax + b$, where a and b are constant real numbers. Which one of the following is NOT correct?
- A. The graph of f is a straight line. B. If $a > 0$, then the graph of f is increasing.
- C. If $a = 0$, then the graph of f is a vertical line.
- D. If $a \neq 0$, then $(-\frac{a}{b}, 0)$ is the point at which the graph of f intersects the x -axis

84. The vertex of a quadratic function $f(x) = x^2 - 2x + 1$ is:

- A. (1, 0) B. (0, 1) C. (0, 0) D. (1, 1)

III. WORKOUT :SHOW ALL THE NECESSARILY STEPS

85. Given a linear function

$f = \{(x, y) : y = 5m - n\}$ for some constant m and n such that $f(-2) = -12$ and $\left(1, \frac{3}{2}\right)$ is belong to f . what is the possible value of m and n ?

86. Let $f = \{(2, 3), (4, 9), (1, 10), (3, -12)\}$ and $g = \{(1, 2), (-1, -3), (3, 15), (4, -3)\}$, then:-

- Find the domain and range of $(f + g)$, $(f - g)$ and $f * g$
- Find the value of $(f + g)(3)$, $(f * g)(1)$ and $(f^2 * g)(4)$

87. Let $f(x)$ and $g(x)$ be a function defined by $f(x) = \begin{cases} \sqrt{x^2 - 3} & \text{if } x \leq 3 \\ 3x + 1 & \text{if } x > 3 \end{cases}$ and

$\begin{cases} 3 + |x - 5| & \text{if } x \leq 0 \\ -2 + x^2 & \text{if } x > 0 \end{cases}$ then find $(f + g)(2)$ and $(f + g)(-2)$

88. Sketch the graph and find the domain and range of the relation

$$R = \{(x, y) : y < 2x + 10, y < -3x + 9 \text{ and } y > 2\}$$

89. For $f(x) = -3x^2 - 9x + 2$ determine its:

- Domain & range
- Vertex
- Axis of symmetry
- Maximum value

90. Let $f(x) = \frac{x+6}{3x}$ and $g(x) = \frac{2x+4}{x+5}$ then:

- determine the domain of $(f + g)$, $(f - g)$ and $(f * g)$
- Find $(f + g)(-1)$ and $\left(\frac{f}{g}\right)(0)$