Choose the correct answer, write your answer in the table below:

1. The quadrant for which the first coordinate is negative and the second coordinate is positive is:

a) IV b) III c) II d) I

---

2. The translation of "20 less than d" is:

a) $20 + d$ b) $d - 20$ c) $20 - d$ d) $20d$

---

3. The value of the expression $\left(-\frac{1}{3}\right)^0$ is equal to:

a) $-\frac{1}{3}$ b) 0 c) -3 d) 1

---

4. Suppose $3y - 2 = 2x$. When $y=4$, the value of x is:

a) 5 b) -5 c) -1 d) 6

5. The equation of the line containing the point (2,-1) and parallel to the line $y = -3x + 2$ is

a) $y = 3x - 5$ b) $y = \frac{x}{3} + \frac{1}{3}$ c) $y = -3x + 5$ d) $y = -\frac{x}{3} + \frac{1}{3}$

---

6. The product of the **slopes** of two perpendicular lines is:

a) 0 b) -1 c) 1 d) 2

---

7. The solution of $6x - 7 = -3x + 20$ is:

a) 3 b) -9 c) -3 d) 9

---

8. The inequality $-x < 5$ is equivalent to:

a) $2x < 5$ b) $2x < -10$ c) $2x > 5$ d) $2x > -10$

---

9. The greatest common factor (GCF) of $2y^2$ and $4xy$ is:

a) $2y$ b) $4y$ c) $2xy$ d) $4xy$

10. The coordinates of the y-intercept of the line $y = -2x + 3$ are:

a) $(0,-2)$ b) $(0,3)$ c) $(3,0)$ d) $(-2,0)$

---

11. The factorization of the polynomial $x(x-3)-2(x-3)$ is:

a) $(x^2-2)(x-3)$ b) $(x+2)(x-3)$ c) $(x-2)(x-3)$ d) $(x^2+2)(x-3)$

---

12. The set of numbers for which the rational expression $\dfrac{(x-2)(x+5)}{(x+4)(x+3)}$ is not defined is:

a) $\{4,3\}$ b) $\{-2,5\}$ c) $\{2,-5\}$ d) $\{-4,-3\}$

---

13. The domain of the function $f(x)=\sqrt{x+2}$ is:

a) $\{x \mid x \text{ is a real number and } x \neq -2\}$ b) $\{x \mid x \text{ is a real number and } x \geq -2\}$

c) $\{x \mid x \text{ is a real number and } x \neq 0\}$ d) $\{x \mid x \text{ is a real number and } x \neq 2\}$

---

14. The value of $\sqrt[3]{27x^3}$ is :

a) $3x$ b) $9\sqrt{x}$ c) $-3x$ d) $-9\sqrt{x}$

---

15. The factorization of $x^2 - 25$ is:

a) $(x-5)^2$ b) $(x-5)(x+5)$ c) $(x-25)^2$ d) $(x+25)(x-25$

---

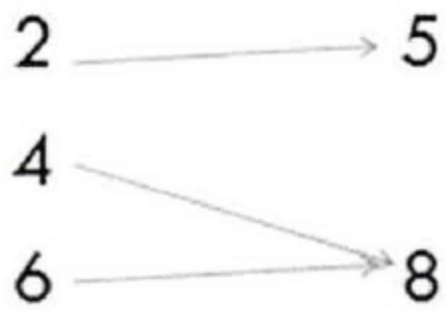
16. The result of $(3x-2)^2$ is:

a) $9x^2 - 4$ b) $9x - 6x + 4$ c) $9x^2 - 6x + 4$ d) $9x^2 - 12x + 4$

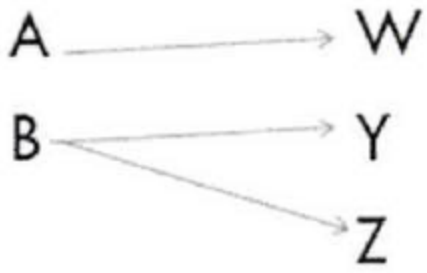
17. Which of the following correspondences IS NOT a function?

a)

b)



c)



18. If $f(x) = \sqrt{x^3 + 2x - 3}$, then $f(2)$ is equal to:

a) $\sqrt{3}$ b) 3 c) 9 d) 8

---

19. The result of $\frac{2x}{y} - \frac{4}{x}$ is :

a) $\frac{2x-4}{x+y}$ b) $\frac{2x-4}{xy}$ c) $\frac{2x^2-4y}{xy}$ d) $\frac{4x-y}{xy}$

---

20. The result of $(2x^2y^3)^3$ is::

a) $8x^6y^6$ b) $8x^6y^5$ c) $8x^9y^6$ d) $8x^6y^9$

Question 2:(4 points)

1. Multiply: $(x + \sqrt{3})(x - \sqrt{3})$

$x^2 + \sqrt{3}x - \sqrt{3}x - (\sqrt{3})^2$

$x^2 - 3$

2. Perform and simplify $\frac{x-3}{x+6} \div \frac{2(x-3)}{(x-1)(x+6)}$

$$= \frac{x-3}{x+6} \cdot \frac{(x-1)(x+6)}{2(x-3)}$$

$$= \frac{x-1}{2}$$

1. $x - 1 = \sqrt{x+5}$

$$(x-1)^2 = (\sqrt{x+5})^2$$

$$(x-1)^2 = x+5$$

$$x^2 - 2x + 1 = x + 5$$

$$x^2 - 2x - x + 1 - 5 = 0$$

$$x^2 - 3x - 4 = 0$$

$$(x+1)(x-4)$$

$$x = \{-1, 4\}$$

2. $x^2 - x + 2 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{1 \pm \sqrt{7}\, i}{2}$$

$x =$ Not Real

$$a = 1$$
$$b = -1$$
$$c = 2$$

$$\sqrt{b^2 - 4ac}$$

$$= \sqrt{1 - 8}$$

$$= \sqrt{-7}$$

$$= \sqrt{7}\, i$$

Question 4: (4 points)

Solve the following inequalities and write

1. $2x - 8 < -3x + 2$

$2x + 3x < 2 + 8$

$5x < 10$

$x < 2$

$(-\infty, 2)$

2. $|x-3| \leq 4$

$x - 3 \leq 4$, $x - 3 \geq -4$

$x \leq 7$ $x \geq -1$

$-1 \leq x \leq 7$

$[-1, 7]$

Question 5: (8 points)

1. Graph the lines $y = x + 3$ and $y = -x + 3$, and then, shadethe solutions of the system

$$\begin{cases} y < x + 3 \\ y > -x + 3 \end{cases}$$

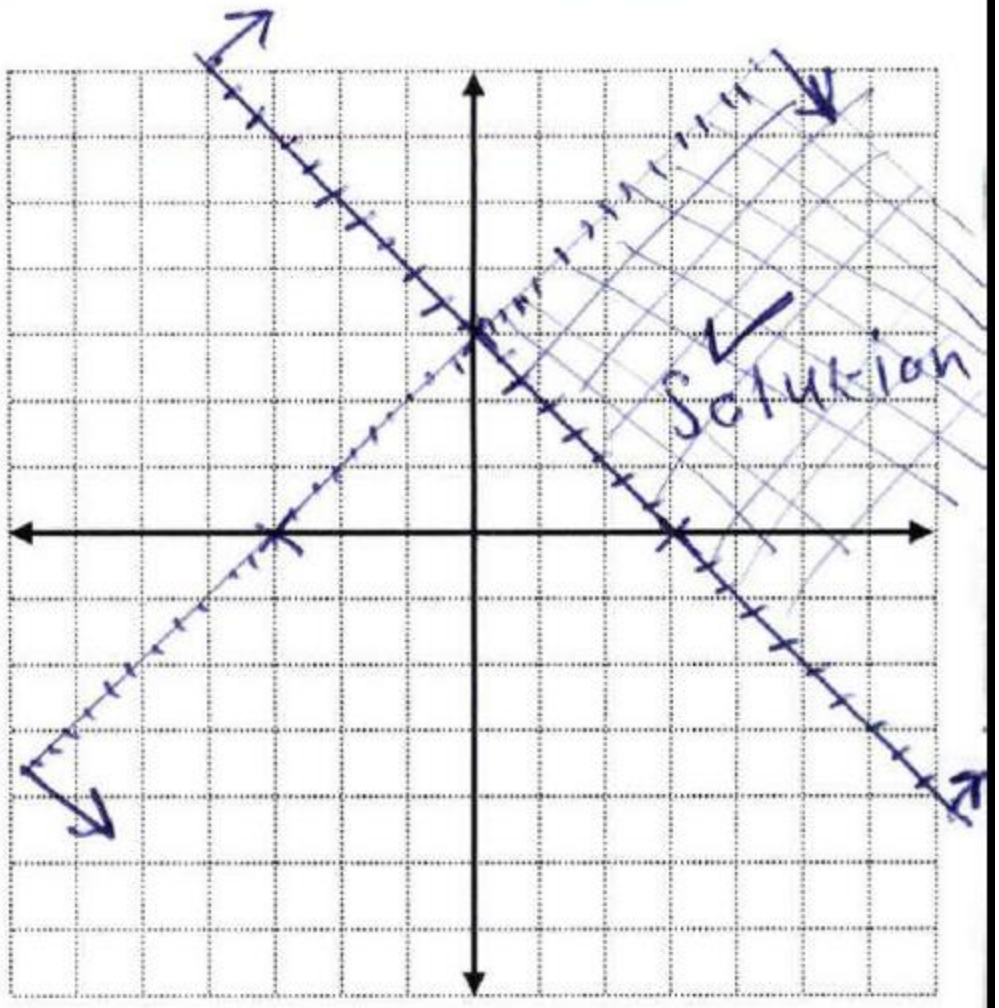
(0, 3), (−3, 0)
(0, 3), (3, 0)

$y < x + 3$

(0,0) $0 < 0 + 3$ ✓

$y > -x + 3$

$0 > 0 + 3$ ✗


Solution

2. Solve the following system of equations:

$$\begin{cases} x + y = 8 & \text{—— ①} \\ 2x - y = 7 & \text{—— ②} \end{cases}$$

① + ②: $\frac{3x}{3} = \frac{15}{3} \longrightarrow x = 5$

$x + y = 8$

$5 + y = 8$

$y = 8 - 5$

$y = 3$