

- Q1** Solve the inequality  $\frac{x}{3} - \frac{x-2}{4} > \frac{x-1}{5}$ , where  $x$  belongs to  $\mathbb{R}$   
 (A)  $(-\infty, -6)$   
 (B)  $(6, \infty)$   
 (C)  $(-\infty, -6]$   
 (D)  $(-\infty, 6)$
- Q2** The solution of the  $-12 < \frac{4-3x}{-5} < 2$  is  
 (A)  $56/3 < x < 14/3$   
 (B)  $-56/3 < x < -14/3$   
 (C)  $56/3 < x < -14/3$   
 (D)  $-56/3 < x < 14/3$
- Q3** If  $x > -2$  and  $x < 9$ , then  $x$   
 (A)  $(9, -2)$  (B)  $(-2, 9]$   
 (C)  $[9, -2)$  (D)  $(-2, 9)$
- Q4** The solution set of  $\frac{3(x-2)}{5} \geq \frac{5(2-x)}{15}$  is  
 (A)  $[2, \infty)$  (B)  $(-\infty, 2]$   
 (C)  $(2, \infty)$  (D)  $(-\infty, 2)$
- Q5** If  $x \in (-3, 2)$  then  $x^2$   
 (A)  $(4, 9)$  (B)  $[0, 9)$   
 (C)  $(9, 4)$  (D)  $(-9, 4)$
- Q6** Solution set of  $\frac{5}{x-2} > 3$   
 (A)  $(2, \frac{11}{3}]$  (B)  $[2, \frac{11}{3})$   
 (C)  $(2, \frac{11}{3})$  (D) None
- Q7** Solve  $x^2(x+3) > 0$   
 (A)  $(-3, \infty)$   
 (B)  $(-3, 0) \cup (0, \infty)$   
 (C)  $(3, \infty)$   
 (D)  $[0, \infty)$
- Q8** Find  $x$  if  $(x+2) \times (x-3) \leq 0$ .  
 (A)  $[-2, 3]$  (B)  $[-3, 2]$   
 (C)  $(-2, 3)$  (D)  $(-3, 2)$
- Q9** If  $|x+2| \leq 9$ , then  
 (A)  $x \in (-7, 11)$   
 (B)  $x \in [-11, 7]$   
 (C)  $x \in (-\infty, -7) \cup (11, \infty)$   
 (D)  $x \in (-\infty, -7) \cup [11, \infty)$
- Q10** If  $|x-9|/(x-9) \geq 0$ , then  
 (A)  $x \in [9, \infty)$   
 (B)  $x \in (9, \infty)$   
 (C)  $x \in (-\infty, 9)$   
 (D)  $x \in (-\infty, 9]$
- Q11** Solve :  $f(x) = \frac{(x-1)(2-x)}{x-3} \geq 0$   
 (A)  $(-\infty, 1] \cup (2, 3)$   
 (B)  $(-\infty, 1] \cup [2, 3)$   
 (C)  $(-\infty, 1] \cup (3, \infty)$   
 (D) None of these
- Q12**  $\frac{8x^2+16x-51}{(2x-3)(x+4)} > 3$  if  $x$  is such that  
 (A)  $x < -4$   
 (B)  $-3 < x < \frac{3}{2}$   
 (C)  $x > \frac{5}{2}$   
 (D) All of these
- Q13** Solve  $\frac{x-2}{x+2} > \frac{2x-3}{4x-1}$   
 (A)  $(-\infty, -2) \cup (\frac{1}{4}, 1) \cup (4, \infty)$   
 (B)  $(-\infty, -1) \cup (4, \infty)$   
 (C)  $(-\infty, 4)$   
 (D)  $(-\infty, \infty)$
- Q14** If  $x \in (-5, -3)$  then  $x^2$   
 (A)  $(9, 25)$  (B)  $(25, 9)$   
 (C)  $(0, \infty)$  (D)  $(9, \infty)$



- Q15** Solve  $\frac{(x-3)(x+5)(x-7)}{|x-4|(x+6)} \leq 0$   
 (A)  $(-6, -5] \cup [3, 4) \cup (4, 7]$   
 (B)  $(-9, -5) \cup (1, 3) \cup (2, 4)$   
 (C)  $(1, 3) \cup (2, 4)$   
 (D)  $(-8, -6)$
- Q16** Solution of  $(x-1)^2(x+4) < 0$  is  
 (A)  $(-\infty, 1)$   
 (B)  $(-\infty, -4)$   
 (C)  $(-1, 4)$   
 (D)  $(1, 4)$
- Q17** If  $|x-2| \leq 1$ , then  
 (A)  $x \in (1, 3)$   
 (B)  $x \in (-1, 3)$   
 (C)  $x \in [1, 3]$   
 (D)  $x \in [-1, 3]$
- Q18** The length of a rectangle is three times the breadth. If the minimum perimeter of the rectangle is 160 cm, then  
 (A) Breadth  $> 20$  cm  
 (B) Length  $< 20$  cm  
 (C) Breadth  $\geq 20$  cm  
 (D) Length  $\leq 20$  cm
- Q19** Solve the inequality  $\frac{x}{3} - \frac{x-2}{6} > \frac{x-1}{5}$ , where  $x$  belongs to  $\mathbb{R}$ .  
 (A)  $(-\infty, 16)$   
 (B)  $(6, \infty)$   
 (C)  $(-\infty, -6]$   
 (D)  $(-\infty, 6)$
- Q20** Find  $x$  if  $(2-x)(3+x)(4-x) \leq 0$ .  
 (A)  $(-\infty, -3) \cup (2, 4)$   
 (B)  $(-\infty, -3] \cup (2, 4)$   
 (C)  $(-\infty, -3] \cup [2, 4]$   
 (D)  $(-\infty, -3) \cup [2, 4]$
- Q21** The solution set of the inequation  $|x+2| \leq 5$  is  
 (A)  $(-7, 5)$  (B)  $[-7, 3]$   
 (C)  $[-5, 5]$  (D)  $(-7, 3)$
- Q22** Solve :  $x-3 \geq 4 - \frac{7x}{2}$  and  $4 - \frac{7x}{2} \geq 18$   
 (A)  $(-\infty, -4)$   
 (B)  $[14/9, \infty]$   
 (C)  $[-\infty, -4] \cup [14/9, \infty]$   
 (D)  $(-\infty, -4) \cup (14/9, \infty)$
- Q23** The interval in which  $f(x) = (x-1)(x-2)(x-3)$  is negative is  
 (A)  $x > 2$   
 (B)  $2 < x$  and  $x < 1$   
 (C)  $2 < x < 1$  and  $x < 3$   
 (D)  $2 < x < 3$  and  $x < 1$
- Q24** Solution of  $|x^2 - 10| \leq 6$  is  
 (A)  $(2, 4)$   
 (B)  $(-4, -2)$   
 (C)  $(-4, -2) \cup (2, 4)$   
 (D)  $[-4, -2] \cup [2, 4]$
- Q25** Solve  $\frac{|x-2|(x+2)(x+3)}{x^2(x-5)} \geq 0$   
 (A)  $[-3, -2) \cup (5, \infty)$   
 (B)  $(-3, -2) \cup (5, \infty)$   
 (C)  $[-3, -2] \cup (5, \infty)$   
 (D)  $[-3, -2) \cup [5, \infty)$
- Q26** All possible values of  $\sqrt{9-x^2}$   
 (A)  $(0, 3)$  (B)  $(-3, 3)$   
 (C)  $[0, 3]$  (D)  $[0, \infty)$
- Q27** For real value of  $x$ ,  $2x^2 + 5x - 3 > 0$ , if  
 (A)  $x < -2$   
 (B)  $x > 0$   
 (C)  $x > 1$   
 (D) None of these
- Q28** Solve  $(x-1)(x-2)(1-2x) > 0$   
 (A)  $(-\infty, \frac{1}{2}) \cup (1, 2)$   
 (B)  $(-\infty, \frac{-1}{2}) \cup (2, \infty)$   
 (C)  $(\frac{-1}{2}, 1) \cup (2, \infty)$   
 (D)  $(-\infty, \frac{-1}{2}) \cup (1, 2)$



**Q29** The solution of  $x^2 - 3x - 4 < 0$  lies in

(A) (-4,1)

(B) (-1, 4)

(C) [-1, 4]

(D) (-1, 4]

**Q30** The solution set of  $|x + 1| + |x - 1| = 2$

(A) (-1,1)

(B) [-1,1)

(C) [1, 2]

(D) [-1,1]



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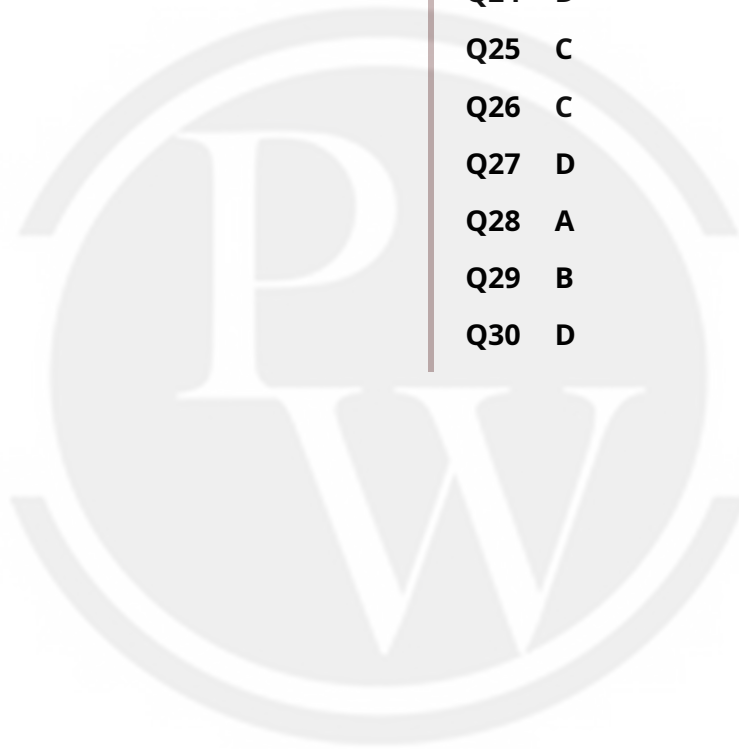
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# Answer Key

Q1 D  
Q2 D  
Q3 D  
Q4 A  
Q5 B  
Q6 C  
Q7 B  
Q8 A  
Q9 B  
Q10 B  
Q11 B  
Q12 D  
Q13 A  
Q14 A  
Q15 A

Q16 B  
Q17 C  
Q18 C  
Q19 D  
Q20 C  
Q21 B  
Q22 C  
Q23 D  
Q24 D  
Q25 C  
Q26 C  
Q27 D  
Q28 A  
Q29 B  
Q30 D



# Hints & Solutions

Note: scan the QR code to watch video solution

## Q1 Text Solution:

$$\begin{aligned} \text{We have } \frac{x}{3} - \frac{x-2}{4} &> \frac{x-1}{5} \\ \Rightarrow \frac{4x-3x+6}{12} &> \frac{x-1}{5} \Rightarrow \frac{x+6}{12} > \frac{x-1}{5} \\ \Rightarrow 5x + 30 &> 12x - 12 \Rightarrow x < 6 \quad \therefore x \\ &\in (-\infty, 6) \end{aligned}$$

### Video Solution:



## Q2 Text Solution:

$$\begin{aligned} -12 < \frac{(4-3x)}{-5} < 2 \\ -10 < 4-3x < 60 \\ -14 < -3x < 56 \\ \frac{-56}{3} < x < \frac{14}{3} \end{aligned}$$

### Video Solution:



## Q3 Text Solution:

$$x > -2 \text{ and } x < 9 \quad x \in (-2, 9)$$

### Video Solution:



## Q4 Text Solution:

$$\begin{aligned} \text{The inequality is } \frac{3(x-2)}{5} &\geq \frac{5(2-x)}{15} \\ 3 \times 3(x-2) &\geq 5(2-x) \text{ or } 9(x-2) \geq 5(2-x) \\ \text{Simplifying, } 9x - 18 &\geq 10 - 5x \\ 9x + 5x &\geq 10 + 18 \text{ or } 14x \geq 28 \\ \text{Dividing both sides by } 14, &\text{ we get } x \geq 2 \end{aligned}$$

### Video Solution:

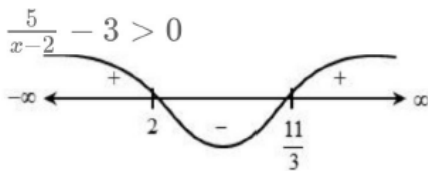


## Q5 Text Solution:

$$\begin{aligned} \text{Given } x &\in (-3, 2) \\ x^2 &\in [0, 9) \end{aligned}$$

### Video Solution:



**Q6 Text Solution:**

$$\frac{5-3x+6}{x-2} > 0$$

$$\frac{11-3x}{x-2} > 0$$

$$\frac{3x-11}{x-2} < 0$$

$$x = 2, \frac{11}{3}$$

**Video Solution:****Q7 Text Solution:**

$$x^2(x+3) > 0$$

$$\text{WKT } x^2 > 0 \quad \forall x \in \mathbb{R} - \{0\}$$

$$\Rightarrow x+3 > 0$$

$$\Rightarrow x > -3 \text{ but } x \neq 0$$

$$\therefore x \in (-3, 0) \cup (0, \infty)$$

**Video Solution:****Q8 Text Solution:**

$$\text{Given } (x+2)(x-3) = 0.$$

critical points are.

$$x = -2 \text{ and } x = 3$$

$$x \in [-2, 3]$$

**Video Solution:****Q9 Text Solution:**

$$|x+2| \leq 9$$

$$\Rightarrow -9 \leq x+2 \leq 9$$

$$-11 \leq x \leq 7 \Rightarrow x \in [-11, 7]$$

**Video Solution:****Q10 Text Solution:**

By using the key concept:

$$\frac{a}{b} \geq 0 \Rightarrow a \geq 0 \text{ \& } b > 0$$

Since  $|x| \geq 0$ , clearly  $x \in (9, \infty)$

**Video Solution:**

**Q11 Text Solution:**

By solving the given inequality using wavy curve method we get,  
 $x \in (-\infty, 1] \cup [2, 3)$

**Video Solution:****Q12 Text Solution:**

The given inequality is satisfied for all the values of  
 $x < -4$ ;  $-3 < x < \frac{3}{2}$ ;  $x > \frac{5}{2}$

**Video Solution:****Q13 Text Solution:**

By rearranging the given inequality we get

$$\frac{(x-4)(x-1)}{(x+2)(4x-1)} > 0$$

$\Rightarrow$  Critical points are :  $x = 4, x = 1, x = \frac{1}{4}, x = -2$

Then by wavy curve Method obtain the required interval of  $x$  i.e.

$$(-\infty, -2) \cup (\frac{1}{4}, 1) \cup (4, \infty)$$

**Video Solution:****Q14 Text Solution:**

Given  $x \in (-5, -3)$

$$x^2 \in (9, 25)$$

**Video Solution:****Q15 Text Solution:**

Using the property of modulus function

$$|x - 4| = \begin{cases} -(x - 4) & x < 4 \\ (x - 4) & x \geq 4 \end{cases}$$

We discuss the given inequality into two cases and then find the required values of  $x$ .

**Video Solution:****Q16 Text Solution:**

$(x - 1)^2$  is always positive except when  $x = 1$  (and then it is 0)

solutions of  $(x - 1)^2 (x + 4) < 0$  when  
 $x + 4 < 0$  and  $x \neq 1$ .  $\therefore x \in (-\infty, -4)$

**Video Solution:**

**Q17 Text Solution:**

$$\text{Here, } |x - 2| \leq 1 \quad -1 \leq x - 2 \leq 1$$

$$1 \leq x \leq 3 \quad x \in [1, 3]$$

**Video Solution:****Q18 Text Solution:**

Let 'x' be the breadth of the rectangle and '3x' be the length of rectangle.

$$2(3x + x) \geq 160$$

$$8x \geq 160$$

$$x \geq 20$$

$$\text{Hence Breadth} \geq 20$$

**Video Solution:****Q19 Text Solution:****(D)**

We have,

$$\frac{x}{3} - \frac{x-2}{6} > \frac{x-1}{5}$$

$$\Rightarrow \frac{2x-x+2}{6} > \frac{x-1}{5} \Rightarrow \frac{x+2}{6} > \frac{x-1}{5}$$

$$\Rightarrow 5x + 10 > 6x - 6$$

$$\Rightarrow x < 16$$

$$\therefore x \in (-\infty, 16)$$

**Video Solution:****Q20 Text Solution:**

$$\text{Solution: } (-1)(x-2)(x-3)(-1)(x-4) \leq 0. + (x-2)(x+3)(x-4) \leq 0.$$

$$\text{Critical points are } x = 2 \quad x = -3 \quad x = 4$$

$$(x-2) \quad - \quad - \quad + \quad +$$

$$(x+3) \quad - \quad - \quad + \quad +$$

$$(x-4) \quad - \quad - \quad - \quad +$$

$$-\infty \quad \ominus \quad -3 \quad 2 \quad \ominus \quad 4 \quad \infty$$

$$\text{Givne } \leq 0$$

$$x \in (-\infty, -3] \quad [2, 4]$$

**Video Solution:****Q21 Text Solution:**

$$|x + 2| \leq 5$$

$$\Rightarrow -5 \leq x + 2 \leq 5$$

$$-7 \leq x \leq 3 \Rightarrow x \in [-7, 3]$$

**Video Solution:**

**Q22 Text Solution:**

$$(i) \text{ and } (ii) \Rightarrow x \in [-\infty, -4] \cup \left[\frac{14}{9}, \infty\right]$$

**Video Solution:**



**Q23 Text Solution:**

$$(x - 1)(x - 2)(x - 3) < 0$$

By solving this inequality using wavy curve method we get

$$x < 1 \text{ and } 2 < x < 3$$

**Video Solution:**



**Q24 Text Solution:**

$$x \in [-4, -2] \cup [2, 4]$$

**Video Solution:**



**Q25 Text Solution:**

**Video Solution:**



**Q26 Text Solution:**

$$\text{Since } 0 \leq \sqrt{9 - x^2} \leq 3$$

$\therefore$  Required values of  $x$  are  $[0, 3]$

**Video Solution:**



**Q27 Text Solution:**

The given inequality will be satisfied for all the values of  $x$  such that  $x < -3$  and  $x > 1/2$ .

**Video Solution:**



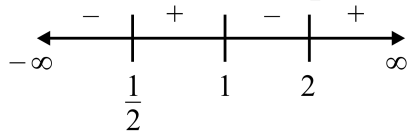
**Q28 Text Solution:**

$$-2(x - 1/2)(x - 1)(x - 2) > 0$$

$$\div |y - 2$$

$$(x - 1/2)(x - 1)(x - 2) < 0$$

Critical prints are  $x = \frac{1}{2}, 1, 2$



$$x \in (-\infty, +1/2) \cup (1, 2)$$

**Video Solution:**



**Q29 Text Solution:**

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



$$x^2 - 4x + x - 4 < 0$$

$$x(x - 4) + (x - 4) < 0$$

$$(x - 4)(x + 1) < 0$$

$$x \in (-1, 4)$$

**Video Solution:**



**Q30 Text Solution:**

(i) if  $x < -1$  then

$$-(x + 1) - (x - 1) \geq 2$$

$$-x - 1 - x + 1 \geq 2$$

$$-2x \geq 2$$

$x \leq -1$  Not a valid condition  $x < -1$

(ii) if  $-1 \leq x \leq 1$  then,  $x + 1 - (x - 1) \geq 2$

$$x + 1 - x + 1 \geq 2 \quad 2 \geq 2 \text{ is valid.}$$

(iii) if  $x > 1$ , then  $x + 1 + x - 1 \geq 2 \quad 2x \geq 2$

$x \geq 1$  Not a valid condition

$$-1 \leq x \leq 1 \quad x \in [-1, 1]$$

**Video Solution:**



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