

Concept MCQs 4

1 ID 35- Rational Inequalities

1. What is the correct next step in solving the following inequality?

$$\frac{3x+4}{x-5} > 2, x \neq 5$$

- (a) $(x-5)^2 \cdot \frac{(3x+4)}{x-5} > (x-5)^2 \cdot 2$
- (b) $(x-5) \cdot \frac{(3x+4)}{x-5} > (x-5) \cdot 2$
- (c) $(x+5) \frac{(3x+4)}{x-5} > (x+5) \cdot 2$
- (d) I don't know yet.

2. In solving the following inequality

$$\frac{x-5}{x-1} \leq 3, x \neq 1$$

why must one multiply both sides by $(x-1)^2$, rather than $(x-1)$:

$$(x-1)^2 \frac{(x-5)}{x-1} \leq 3(x-1)^2$$

- (a) Because $(x-1)$ is negative and we cannot multiply by a negative in inequalities.
- (b) $(x-1)^2$ is definitely positive, so the inequality sign remains facing the same way.
- (c) One should multiply both sides by $(x-1)$ to keep it simpler.
- (d) I don't know yet

2 ID 4 : Complex Algebraic Fractions

1. What is

$$\frac{\frac{3}{x+1}}{\frac{2}{x-2}}$$

- (a) $\frac{6}{x^2-x-2}$
- (b) $\frac{3x+3}{2x-4}$
- (c) $\frac{3x-6-2x+4}{x^2-x-2}$

- (d) $\frac{3x-6}{2x+2}$ *
- (e) I don't know yet.
2. What is $\frac{x^2+3x-4}{5x+20}$ in its simplest form?
- (a) $\frac{x+4}{5}$
- (b) $\frac{x+1}{5}$
- (c) $\frac{x-1}{5}$
- (d) I don't know yet.
3. What is $\frac{4x^2-9}{2x^2+5x+3}$ in its simplest form?
- (a) $\frac{2x-3}{x+1}$
- (b) $\frac{2x+3}{x-1}$
- (c) $\frac{4x^2-9}{2x^2+5x+3}$
- (d) I don't know yet.

3 ID 32 : Simultaneous Equations : One Linear and One Non-Linear

1. What is a correct procedure for solving the following simultaneous equations:

$$\begin{aligned}x + y &= 7 \\x^2 + y^2 &= 25\end{aligned}$$

- (a) $x^2 + (7 + x)^2 = 25$
- (b) $(7 - y)^2 + y^2 = 25$
- (c) $(7 + y)^2 + y = 7$
- (d) I don't know
2. Which of the following substitutions is correct when solving the simultaneous equations:

$$\begin{aligned}x^2 + y^2 + 2x - 4y + 3 &= 0 \\x - y + 3 &= 0\end{aligned}$$

- (a) $(y - 3)^2 + y^2 + 2(y - 3) - 4y + 3 = 0$
- (b) $x^2 + (x + 3)^2 + 2x - 4y + 3 = 0$
- (c) $x^2 + (x - 3)^2 + 2x - 4(x - 3) + 3 = 0$
- (d) $(y - 3)^2 + y^2 + 2x - 4y + 3 = 0$
- (e) I don't know.

4 ID 22 : Cubic Equations : Unknown Co-Efficients Using Factors

1. If $x^3 + 2x^2 + px^2 + 3x - p + r = x^3 + 4x^2 + 3x + 5$, what are correct values for p and r ?
- (a) $p = 4, r = 5$
- (b) $p = 4, r = 9$
- (c) $p = 2, r = 3$
- (d) $p = 2, r = 7$

- (e) I don't know yet.
2. $x^2 + ax + b$ is a factor of $x^3 + px + q$. Which of the identities below is true, considering the following long division method:

$$\begin{array}{r} x^2 \quad +ax \quad +b \) \quad \begin{array}{cccc} x & & -a & \\ \hline x^3 & +0x^2 & +px & +q \\ -(x^3 & +ax^2 & +bx) & \\ \hline & -ax^2 & +(p-b)x & +q \\ -(-ax^2 & -a^2x & -ab) & \\ \hline & & & 0 \end{array} \end{array}$$

- (a) $q = ab, p - b = a^2$
 (b) $q = -ab, p - b + a^2 = 0$
 (c) $q + ab = 0, p - b = a^2$
 (d) I don't know yet.

5 ID 37 : Abstract Inequalities

1. Which of the identities below is true for all $x \in R$?
- (a) $x \geq 0$
 (b) $x + 1 \geq 0$
 (c) $x \leq 0$
 (d) $(x - 1)^2 \geq 0$
 (e) I don't know yet.
2. Which of the following identities is true for all $a, b \in R$
- (a) $a^2 - b^2 \geq 0$
 (b) $a^2 + b^2 \geq 2ab$
 (c) $a^n \geq b^2$
 (d) I don't know yet.
3. Which of the following identities is true for all $a > b$, where $a, b \in R$
- (a) $a - b > 0$
 (b) $a + b > 0$
 (c) $b - a > 0$
 (d) I don't know