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) $(x-5)^2 . \frac{(3x+4)}{x-5} > (x-5)^2 . 2$ *

 (b) $(x-5) . \frac{(3x+4)}{x-5} > (x-5) . 2$

 (c) $(x+5) \frac{(3x+4)}{x-5} > (x+5) . 2$

 (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:
$$x + y = 7$$
$$x^2 + y^2 = 25$$

(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:
$$x^2 + y^2 + 2x - 4y + 3 = 0$$
$$x - y + 3 = 0$$

(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:

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

(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) $a" \geq b^2$

(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