[1] Solve $\dfrac{1}{x-4} - \dfrac{2}{x+2} = \dfrac{6}{x^2-2x-8}$. LCD $= (x-4)(x+2)$ **ANSWER:** <u>NO SOLUTION</u>

$$x + 2 - 2(x-4) = 6$$
$$x + 2 - 2x + 8 = 6$$
$$-x = -4$$
$$\left(\tfrac{1}{2}\right)\; x = 4 \longrightarrow \text{MAKES } 1^{ST} \text{ DENOMINATOR} = 0$$

[2] If $f(x) = 2x^2 - x$, find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$.   **ANSWER:** <u>$4x + 2h - 1$</u>

$$\left(\tfrac{1}{2}\right)\; \frac{2(x+h)^2 - (x+h) - (2x^2 - x)}{h}$$
$$= \frac{2(x^2 + 2hx + h^2) - x - h - 2x^2 + x}{h}$$
$$= \frac{2x^2 + 4hx + 2h^2 - x - h - 2x^2 + x}{h} = 4x + 2h - 1$$

[3] Find the slope-point form of the equation of the line through the point $(-11, 7)$ perpendicular to the line $4x - 6y = -5$.   **ANSWER:** <u>$y - 7 = -\tfrac{3}{2}(x + 11)$</u>

$$-6y = -4x - 5$$
$$\left(\tfrac{1}{2}\right)\; y = \tfrac{2}{3}x + \tfrac{5}{6}$$
$$m = -\tfrac{3}{2}$$

[4] Determine algebraically if the graph of $x^2 y = 4$ is symmetric over the $y-$axis.   **ANSWER:** <u>YES</u>

$$(-x)^2 y = 4$$
$$\left(\tfrac{1}{2}\right)\; x^2 y = 4$$

ADDITIONAL QUESTIONS ON THE OTHER SIDE ➡

[5] Find the x – intercepts of the function $g(x) = 9x^2 - 3x - 1$.

ANSWER: $\dfrac{1 \pm \sqrt{5}}{6}$ ①

$$9x^2 - 3x - 1 = 0$$

$$x = \frac{3 \pm \sqrt{9 + 36}}{18}$$

$$= \frac{3 \pm \sqrt{45}}{18}$$

$$= \frac{3 \pm 3\sqrt{5}}{18} = \frac{1 \pm \sqrt{5}}{6}$$

[6] Find the domain of the function $h(x) = \sqrt{5 - 7x}$.

ANSWER: $\left\{ x \le \dfrac{5}{7} \right\}$

OR

$\left(-\infty, \dfrac{5}{7} \right]$

$$5 - 7x \ge 0$$

$$-7x \ge -5$$

$$x \le \frac{5}{7}$$

[7] The weights w of two-thirds of the members of a population satisfy the inequality
$\left| \dfrac{w - 157}{20} \right| \le 1$, where w is measured in pounds. Determine the interval(s) on the real number line in which these weights lie.

ANSWER: $[137, 177]$

$$-1 \le \frac{w - 157}{20} \le 1$$

$$-20 \le w - 157 \le 20$$

$$137 \le w \le 177 \quad ①$$

[8] The cost C in dollars of producing n computer laptop bags is given by $C = 1.25n + 15{,}750$.
Explain what the C – intercept and slope measure.

ANSWER: THE C-INTERCEPT IS THE FIXED COST IF NO BAGS ARE PRODUCED. THE SLOPE IS THE COST OF PRODUCING EACH BAG

[9] Evaluate $p(x) = \begin{cases} 2x + 7, & x \le -1 \\ 3 - 2x^2, & -1 < x \le 3 \\ 1 - x^2, & x > 3 \end{cases}$ at each specified value of the independent variable below.

[a] $p(3) = 3 - 2(3)^2$

ANSWER: -15

[b] $p(-2) = 2(-2) + 7$

ANSWER: 3