[1] The weights w of one-third of the members of a population satisfy the inequality $\left|\frac{w-165}{30}\right| \geq 1$, where w is measured in pounds. Determine the interval(s) on the real number line in which these weights lie.

ANSWER: $(-\infty, 135] \cup [195, \infty)$

$\frac{w-165}{30} \geq 1$ or $\frac{w-165}{30} \leq -1$

$w-165 \geq 30$ or $w-165 \leq -30$

$w \geq 195$ or $w \leq 135$ (½)

[2] Determine algebraically if the graph of $xy^2 = 4$ is symmetric over the $x-$axis.

ANSWER: YES

$x(-y)^2 = 4$

$xy^2 = 4$ (½)

[3] Find the domain of the function $h(x) = \sqrt{7-3x}$.

ANSWER: $\{x \leq \frac{7}{3}\}$ or $(-\infty, \frac{7}{3}]$

$7-3x \geq 0$

$-3x \geq -7$

$x \leq \frac{7}{3}$

[4] Find the $x-$intercepts of the function $g(x) = 3x^2 - 2x - 2$.

ANSWER: $\frac{1 \pm \sqrt{7}}{3}$ (½)

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

$x = \frac{2 \pm \sqrt{4+24}}{6}$

$= \frac{2 \pm \sqrt{28}}{6}$

$= \frac{2 \pm 2\sqrt{7}}{6} = \frac{1 \pm \sqrt{7}}{3}$

ADDITIONAL QUESTIONS ON THE OTHER SIDE ➡

[5] A kitchen appliance manufacturing company determines that the total cost in dollars of producing x units of a blender is $C = 25x + 3500$. Describe the practical significance of the C – intercept and slope of this line.

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

[6] Evaluate $p(x) = \begin{cases} 2x^2 + 1, & x \le -2 \\ 5 - 4x, & -2 < x < 3 \\ 1 - x^2, & x \ge 3 \end{cases}$ at each specified value of the independent variable below.

[a] $p(-1) =$ $5-4(-1)$

ANSWER: 9

[b] $p(3) =$ $1-3^2$

ANSWER: -8

[7] If $f(x) = x^2 - 2x$, find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$.

ANSWER: $2x+h-2$

$$\frac{(x+h)^2 - 2(x+h) - (x^2 - 2x)}{h} \quad \left(\tfrac{1}{2}\right)$$

$$= \frac{x^2 + 2hx + h^2 - 2x - 2h - x^2 + 2x}{h}$$

$$= 2x + h - 2$$

[8] Find the slope-point form of the equation of the line through the point $(12, -5)$ perpendicular to the line $9x - 6y = -2$.

ANSWER: $y + 5 = -\frac{2}{3}(x - 12)$

$$-6y = -9x - 2$$

$$\left(\tfrac{1}{2}\right) \quad y = \tfrac{3}{2}x + \tfrac{1}{3}$$

$$m = -\tfrac{2}{3}$$

[9] Solve $\dfrac{4}{x-2} - \dfrac{1}{x+3} = \dfrac{5}{x^2 + x - 6}$.

ANSWER: NO SOLUTION

LCD $= (x-2)(x+3)$

$$4(x+3) - (x-2) = 5$$

$$4x + 12 - x + 2 = 5$$

$$3x = -9$$

$$x = -3 \quad \left(\tfrac{1}{2}\right)$$

$\longrightarrow$ MAKES 2ND DENOMINATOR $= 0$