

[1] Solve $\frac{4}{x-2} - \frac{1}{x+3} = \frac{5}{x^2+x-6}$. LCD = $(x-2)(x+3)$

ANSWER:

NO SOLUTION

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

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

$$3x = -9$$

$\left(\frac{1}{2}\right) x = -3 \rightarrow \text{MAKES } 2^{\text{ND}} \text{ DENOMINATOR} = 0$

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

ANSWER:

$2x+h-2$

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

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

$$= 2x+h-2$$

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

ANSWER:

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

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

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

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

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

ANSWER:

YES

$$x(-y)^2 = 4$$

$\left(\frac{1}{2}\right) xy^2 = 4$

ADDITIONAL QUESTIONS ON THE OTHER SIDE →

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

ANSWER: $\left(\frac{1}{2}\right) \left[\frac{1 \pm \sqrt{7}}{3}\right]$

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

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

$$= \left[\frac{2 \pm \sqrt{28}}{6} \right]$$

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

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

ANSWER:

$$\left\{ x \leq \frac{7}{3} \right\} \text{ or } (-\infty, \frac{7}{3}]$$

$$\begin{aligned} 7 - 3x &\geq 0 \\ -3x &\geq -7 \\ x &\leq \frac{7}{3} \end{aligned}$$

- [7] The weights w of one-third of the members of a population satisfy the inequality

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

$\left| \frac{w - 165}{30} \right| \geq 1$, where w is measured in pounds. Determine the interval(s) on the real number line in which these weights lie.

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

$$w - 165 \geq 30 \text{ or } w - 165 \leq -30$$

$$w \geq 195 \text{ or } w \leq 135 \quad \left(\frac{1}{2}\right)$$

- [8] 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

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

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

ANSWER:

$$9$$

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

ANSWER:

$$-8$$