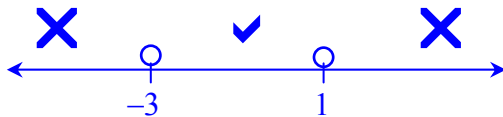


Partial Review

1. Solve $x^2 + 2x - 2 < 1$.

$$\begin{aligned} \text{consider } x^2 + 2x - 2 &= 1 \\ x^2 + 2x - 3 &= 0 \\ (x+3)(x-1) &= 0 \\ x &= -3, x = 1 \end{aligned}$$

Need the 4-Step Process since non-linear



$$x \in (-3, 1)$$

2. Does the equation $4b - 7 = 2a^2b + 15a$ determine b as a function of a ? Show your work.

$$\begin{aligned} 4b - 7 &= 2a^2b + 15a \\ 4b - 2a^2b &= 15a + 7 \\ b(4 - 2a^2) &= 15a + 7 \\ b &= \frac{15a + 7}{4 - 2a^2} \end{aligned}$$

Solve for b

Yes, the equation $4b - 7 = 2a^2b + 15a$ determines b as a function of a .

3. Determine $g(2 - |b|)$ given that $g(t) = \begin{cases} 4t - 7, & \text{if } t < 5 \\ 3 - t, & \text{if } t \geq 5 \end{cases}$

$$\begin{aligned} \text{since } 2 - |b| \leq 2 < 5, \text{ then } g(2 - |b|) &= 4(2 - |b|) - 7 = 8 - 4|b| - 7 \\ &= 1 - 4|b| \end{aligned}$$

(Determine which piece of the domain the argument is in: $|b| \geq 0$, so $-|b| \leq 0$, so $2 - |b| \leq 2 < 5$)

4. Find an equation of the line passing through the point $(2, -5)$ that is perpendicular to the line given by $3x + 4y = 9$.

$$\begin{aligned} \text{slope: } 3x + 4y &= 9 \\ 4y &= -3x + 9 \\ y &= -\frac{3}{4}x + \frac{9}{4} \end{aligned}$$

$$\begin{aligned} m_{\text{given}} &= -\frac{3}{4} \\ m_{\perp} &= \frac{-1}{m_{\text{given}}} = \frac{4}{3} \end{aligned}$$

Must establish how you found perp slope

perp line: $y + 5 = \frac{4}{3}(x - 2)$

$$y = \frac{4}{3}x - \frac{23}{3}$$

Use pt-slope form first!!

5. The Zia Cookie Company sold 14,400 cookies in 1997 and 21,600 cookies in 2002. Assuming linear growth, write an equation for the number of cookies sold as a function of the year.

let t = number of years since 1990

C = number of cookies sold

\therefore pts: (7,14400) and (12,21600)

Always define variables for applications

$$\text{slope: } m = \frac{\Delta C}{\Delta t} = \frac{21600 - 14400}{12 - 7} = 1440$$

$$\text{cookies sold: } C - 14400 = 1440(t - 7)$$

$$C = 1440t + 4320$$

6. In the context of this application, interpret the slope of your equation for the Zia Cookie Company.

The slope indicates that sales for the Zia Cookie Company increase by 1,440 cookies per year.

(must see the words “increase” or “decrease” for describing slope)

7. According to your linear model, how many cookies did the Zia Cookie Company sell in 2005?

let $t = 15$

$$C = 1440(15) + 4320 = 25920$$

According to the linear model, the Zia Cookie Company sold 25,920 cookies in 2005.

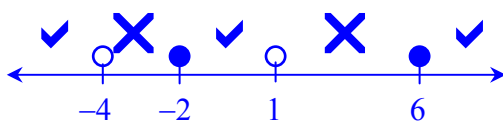
8. Solve $\frac{3x}{x-1} \leq \frac{x}{x+4} + 3$.

$$\text{consider } \frac{3x}{x-1} = \frac{x}{x+4} + 3$$

Clear out fractions by multiplying (carefully) by the LCD!!!

$$\begin{aligned} (x-1)(x+4) \left(\frac{3x}{x-1} \right) &= \left(\frac{x}{x+4} + 3 \right) (x-1)(x+4) \\ 3x(x+4) &= x(x-1) + 3(x-1)(x+4) \\ 3x^2 + 12x &= x^2 - x + 3x^2 + 9x - 12 \\ 0 &= x^2 - 4x - 12 \\ 0 &= (x-6)(x+2) \\ x &= 6 \quad \text{or} \quad x = -2 \end{aligned}$$

Distributive property!!



Don't forget “no-no points” from the denom

$$x \in (-\infty, -4) \cup [-2, 1) \cup [6, \infty)$$

9. Determine the domain of the function given by $f(x) = \frac{\sqrt{25-x^2}}{2x+5}$.

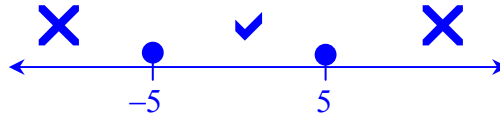
$$2x+5 \neq 0$$

$$x \neq -\frac{5}{2}$$

$$25-x^2 \geq 0$$

consider $25-x^2 = 0$

$$x = \pm 5$$



Now combine radicand and denominator stuff

$$\text{DOM } f = [-5, -\frac{5}{2}) \cup (-\frac{5}{2}, 5] \quad \text{or} \quad [-5, 5] - \{-\frac{5}{2}\}$$

10. Determine the values of t for which $f(t) = g(t)$ given that $f(t) = 4t^3 + 9t^2$ and $g(t) = 4t^2 + 6t$.

$$\text{solve } f(t) = g(t)$$

$$4t^3 + 9t^2 = 4t^2 + 6t$$

$$4t^3 + 5t^2 - 6t = 0$$

Must start by writing the word "solve"!!

$$t(4t^2 + 5t - 6) = 0$$

$$t(4t-3)(t+2) = 0$$

$$t = 0 \quad 4t-3 = 0 \quad t+2 = 0$$

$$t = \frac{3}{4} \quad t = -2$$

$$\therefore f(-2) = g(-2), f(0) = g(0), \text{ and } f(\frac{3}{4}) = g(\frac{3}{4})$$