Bell Ringer

Identify the asymptotes for each of the following equations.

$$f(x) = \frac{2x + 3}{x - 4}$$

$x - 4 = 0$

$x = 4$

VA $\Rightarrow x = 4$

HA: $y = \frac{2}{1} = 2$

$$g(x) = \frac{3x^2 - 2x + 4}{x - 1}$$

$3x + 1$

$x - 1 \overline{)\ 3x^2 - 2x + 4}$

$-3x^2 - 3x$

$x + 4$

$-x - 1$

5

VA: $x = 1$

HA: NO

SA: $y = 3x + 1$

Lesson 3.8

Objectives:

Types of Variation

- Direct Variation: If y varies directly from x, then we will use the equation,

$$\frac{y_1}{x_1} = \frac{y_2}{x_2}$$

- Inverse Variation: If y varies inversely from x, then we will use the equation,

$$\frac{y_1}{x_2} = \frac{y_2}{x_1}$$

- Joint Variation: If y varies jointly from x and z, then we will use the equation,

$$\frac{y_1}{y_2} = \frac{x_1 z_1}{x_2 z_2}$$

Suppose y varies directly as x and $y = 14$ when $x = 8$.

Use the equation to find the value of y when $x = 4$.

$$\frac{y_1}{x_1} = \frac{y_2}{x_2} \rightarrow \frac{14}{8} = \frac{y}{4}$$

$\div 2$ (7)

$$56 = 8y$$

$$7 = y$$

If y varies inversely as x and $y = 102$ when $x = 7$, find x when $y = 12$.

$$\frac{102}{x} = \frac{12}{7}$$

$$12x = 714$$

$$x = 59.5$$

If y varies jointly as x and the cube of z and $y = 16$ when $x = 4$ and $z = 2$, find y when $x = -8$ and $z = -3$.

$$\frac{y_1}{y_2} = \frac{x_1(z_1)^3}{x_2(z_2)^3} \Rightarrow \frac{16}{y} = \frac{4\cdot(2)^3}{-8\cdot(-3)^3}$$

$$\frac{32}{216}$$

$$\frac{32y}{32} = \frac{3456}{32}$$

$$y = 108$$

If r varies inversely as t and $r = 3$ when $t = 4$, find r when $t = 15$.

$$\frac{r_1}{t_2} = \frac{r_2}{t_1}$$

$$\frac{3}{15} = \frac{r}{4} \Rightarrow 12 = 15r$$

$$\frac{4}{5} = \frac{12}{15} = r$$

If y varies directly as the square of x and $y = -54$ when $x = 9$, find y when $x = 6$.

$$\frac{y_1}{(x_1)^2} = \frac{y_2}{(x_2)^2}$$

$$\frac{-54}{9^2} = \frac{y}{6^2}$$

$$81y = -1944$$

$$y = -24$$

3.8 #5-10

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