Name: _____ Date: _____ Period: _____

## 8.1-8.2 Review Worksheet

**State whether each equation represents a direct, inverse, or joint variation, Name the constant of variation.**

1. $y = 2x$

direct; $K = 2$

2. $\frac{x}{5} = y$

direct; $K = \frac{1}{5}$

3. $xy = 12$

$y = 12/x$

inverse; $K = 12$

4. $D = \frac{3}{4}gh$

joint; $K = 3/4$

**Write an equation for each statement. Then, solve the equation.**

5. If $y$ varies inversely as $x$, and $y = 2$ when $x = 8$, find $x$ when $y = 14$.

$y = \frac{K}{x}$ $y = \frac{16}{x}$ $x = \frac{16}{14} = \frac{8}{7}$

$2 = \frac{K}{8}$ $14 = \frac{16}{x}$

$16 = K$

6. If $y$ varies jointly as $x$ and $z$, and $y = 20$ when $x = 2$ and $z = 5$, find $y$ when $x = 14$ and $z = 8$.

$y = Kxz$ $y = 2 \times 2$

$20 = K(2)(5)$ $y = 2(14)(8)$

$2 = K$ $y = 224$

7. If $y$ varies inversely as $x$, and $x = 7$ when $y = 21$, find $y$ when $x = 42$.

$y = \frac{K}{x}$ $y = \frac{147}{x}$

$21 = \frac{K}{7}$ $y = \frac{147}{42}$ $y = 3.5$

$147 = K$

8. Find $y$ when $x = 1.5$ if $y$ varies directly as $x$ and $y = -16$ when $x = 6$.

$y = Kx$ $y = \frac{-8x}{3}$

$-16 = K(6)$ $y = \frac{-8(1.5)}{3}$ $y = -4$

$\frac{-16}{6} = K$

9. The frequency of a vibrating string varies inversely as its length. A string 3 feet long vibrates 175 cycles per second. Find the frequency of a 5 foot string.

$F = \frac{K}{L}$ $F = \frac{525}{L}$ $F = \frac{525}{5}$

$175 = \frac{K}{3}$ $F = 105$ cycles per min

$K = 525$

10. The volume of a can varies jointly as the height of the can and the square of its radius. A can with an 8 inch height and a 4 inch radius has a volume of 402.12 cubic inches. What is the volume of a can that has a 2 inch radius and a 10 inch height?

$V = 3.14 hr^2$

$V = Khr^2$ $V = 3.14(10)(2^2)$

$402.12 = K(8)(4^2)$

$3.14 = K$ $V = 125.6 \text{ in}^3$

11. The time required to process a shipment of goods at Wal-Mart varies directly with the number of items in the shipment and inversely with the number of workers assigned. If 15,000 items can be processed by 8 workers in 10 hours, then how long would it take 12 workers to process 20,000 items?

$t = \frac{Ki}{w}$ $t = \frac{.0053i}{w}$ $t = \frac{.0053(20000)}{10}$

$10 = \frac{K(15000)}{8}$ $K = .0053$ $t = 8.89$ hrs

12. Albertson's found that the demand for Coke products varies inversely as the price of the product. When the price of a Coke product is \$2.75, the weekly demand is 1250. Find the weekly demand if the price is raised to \$4.00.

$D = \frac{K}{P}$ $D = \frac{3437.5}{P}$ $D = \frac{3437.5}{4}$ $D = 859.375$

$1250 = \frac{K}{2.75}$ $K = 3437.5$

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**Write an equation for the following functions. Then, identify the vertical and horizontal asymptotes.**

**13.** The reciprocal parent function has been stretched by a factor of 3, reflected over the x-axis, and translated 2 units to the right.

$y = \frac{-3}{x-2}$ HA $y=0$ VA $x=2$

**14.** The reciprocal parent function has reflected over the x-axis, translated 2 units up, and 5 units left.

$y = \frac{-1}{x+5} + 2$ HA $y=2$ VA $x=-5$

**15.** The reciprocal parent function has been stretched by a factor of 10, translated 5 units down and 2 units right.

$y = \frac{10}{x-2} - 5$ HA $y=-5$ VA $x=2$

**16.** The reciprocal parent function has been stretched by a factor of 1.5, reflected over the x-axis, translated 7 units left and 4 units down.

$y = \frac{-1.5}{x+7} - 4$ HA $y=-4$ VA $x=-7$

**17.** The reciprocal function has a horizontal asymptote of $y = 2$ and a vertical asymptote of $x = -4$.

$y = \frac{1}{x+4} + 2$

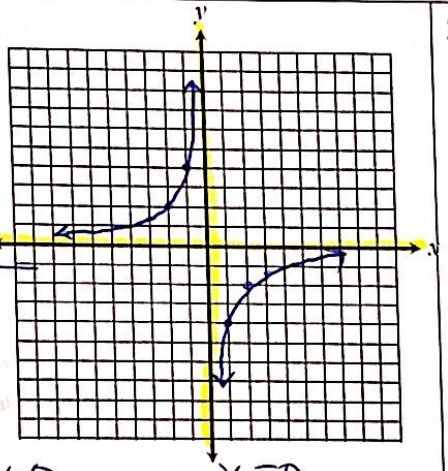
**18.** The reciprocal function has a horizontal asymptote of $y = -8$ and a vertical asymptote of $x = 3$.

$y = \frac{1}{x-3} - 8$

**Graph the following functions. Identify their domain, range, horizontal asymptote, and vertical asymptote.**

**19.** $f(x) = \frac{-4}{x}$

| x | y |
|---|---|
| -3 | 1.3 |
| -2 | 2 |
| -1 | 4 |
| 0 | |
| 1 | -4 |
| 2 | -2 |
| 3 | -1.3 |

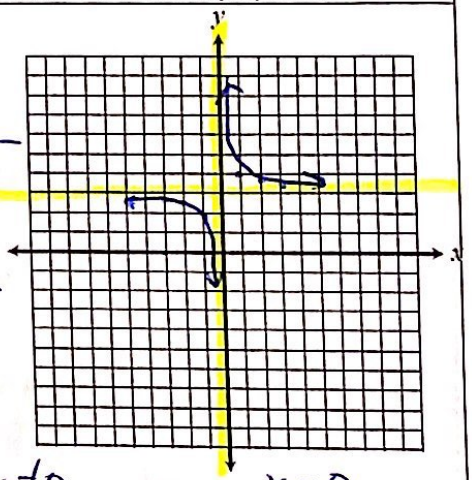


**Domain:** $\mathbb{R}\ x \neq 0$ **VA:** $x=0$

**Range:** $\mathbb{R}\ y \neq 0$ **HA:** $y=0$

**20.** $f(x) = \frac{1}{x} + 3$

| x | y |
|---|---|
| -3 | 2.6 |
| -2 | 2.5 |
| -1 | 2 |
| 0 | |
| 1 | 4 |
| 2 | 3.5 |
| 3 | 3.3 |

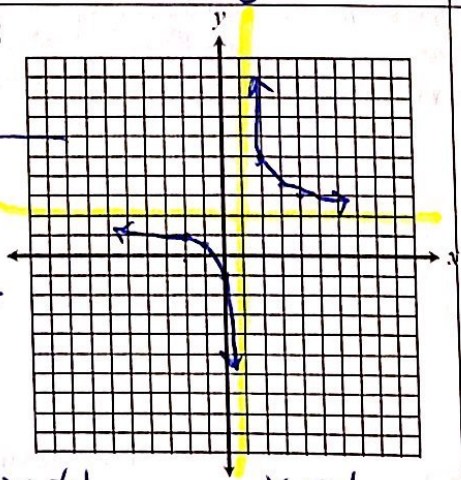


**Domain:** $\mathbb{R}\ x \neq 0$ **VA:** $x=0$

**Range:** $\mathbb{R}\ y \neq 3$ **HA:** $y=3$

**21.** $f(x) = \frac{3}{x-1} + 2$

| x | y |
|---|---|
| -2 | 1 |
| -1 | .5 |
| 0 | -1 |
| 1 | |
| 2 | 5 |
| 3 | 3.5 |
| 4 | 3 |

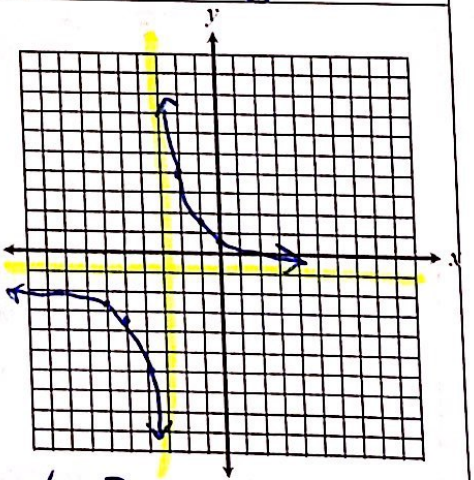


**Domain:** $\mathbb{R}\ x \neq 1$ **VA:** $x=1$

**Range:** $\mathbb{R}\ y \neq 2$ **HA:** $y=2$

**22.** $f(x) = \frac{5}{x+3} - 1$

| x | y |
|---|---|
| -6 | -2.6 |
| -5 | -3.5 |
| -4 | -6 |
| -3 | |
| -2 | 4 |
| -1 | 1.5 |
| 0 | .6 |



**Domain:** $\mathbb{R}\ x \neq -3$ **VA:** $x=-3$

**Range:** $\mathbb{R}\ y \neq -1$ **HA:** $y=-1$

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