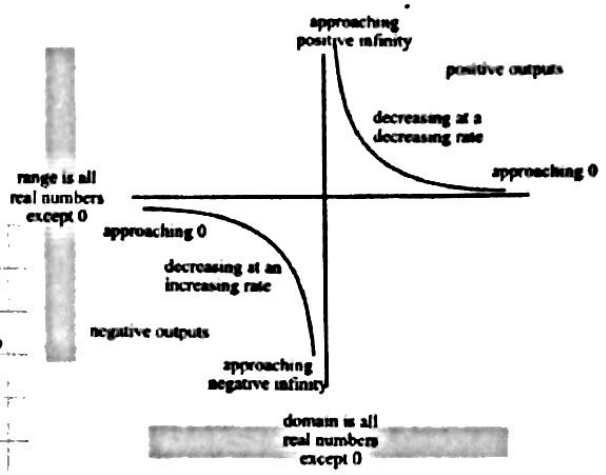


Inverse Variation REVIEW

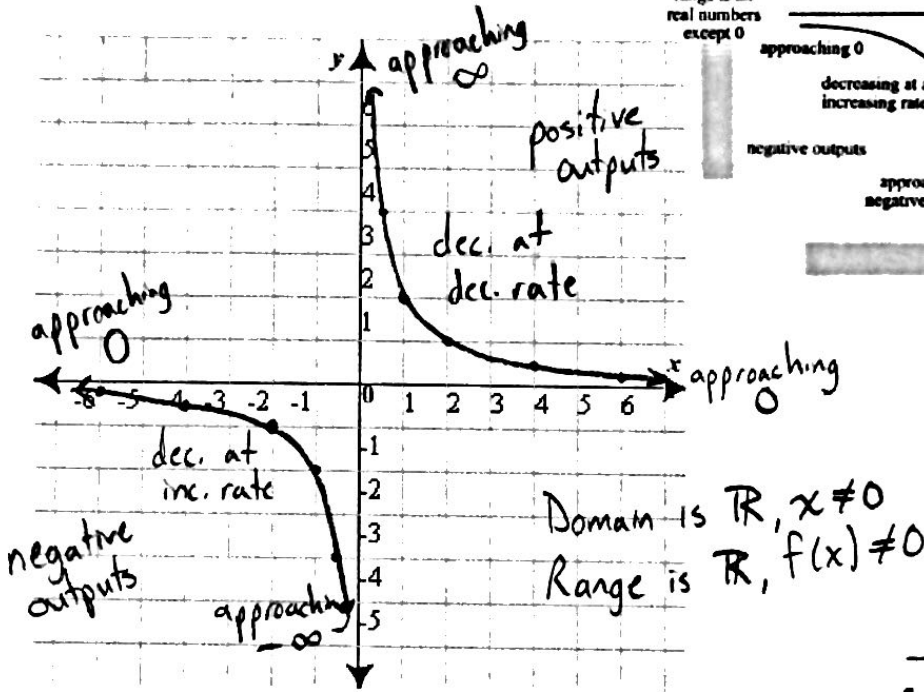
Your test will be calculator *INACTIVE*. Completing these problems, then correcting any mistakes will help you prepare for your test. Good luck!

- 1) Graph and label the key features of the following inverse variation functions. Use the example to the right to help you, but know that this example will NOT be on your test! You are expected to complete these without a calculator. [Hint: for the love of math, make a table!]



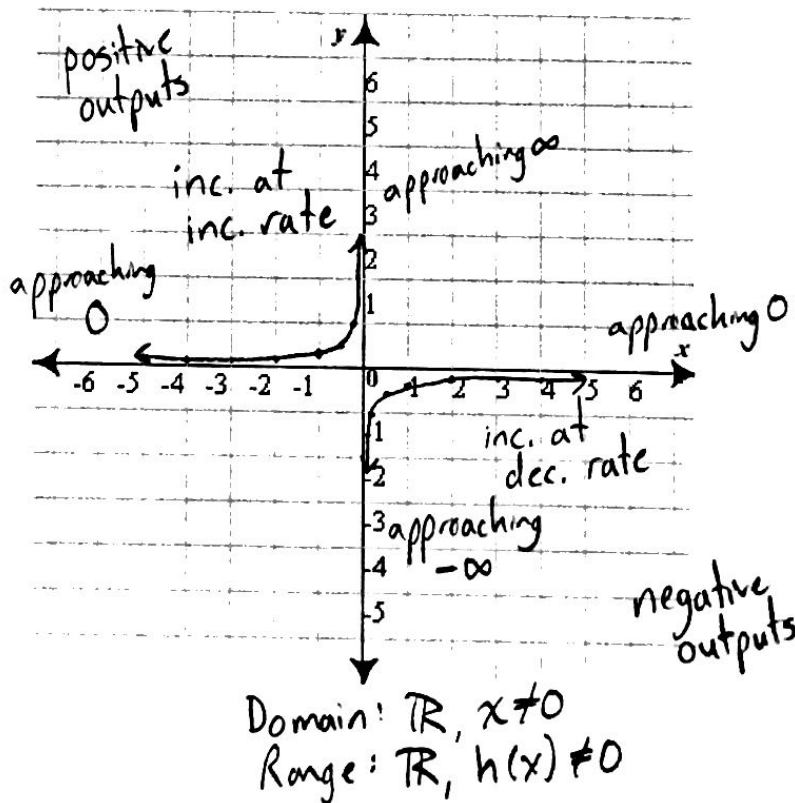
$$f(x) = \frac{2}{x}$$

x	y
-6	-1/3
-4	-1/2
-2	-1
-1	-2
-0.5	-4
0	x



$$h(x) = \frac{-0.25}{x}$$

x	y
-4	+1/16
-2	+1/8
-1	+1/4
-1/2	+1/2
-1/4	+1
0	x



NOTES:

- Only need a handful of coordinates.
- You don't need every number in your table!
- Count → make sure you see ten "labels" and you're covered!

2) For rectangular prisms with the same volume, the area of the base (B) varies inversely with the height (h).

- a) One prism has a base area of 15cm^2 and a height of 5cm . Find the height of another rectangular prism with the same volume but with a base area of 25cm^2 .

$$15 \cdot 5 = 75$$

$$75 \div 25 = 3$$

3cm

- b) What is the volume of each of these prisms? What is this number referred to in discussing inverse variation situations?

75cm^3 → This is the constant of proportionality.

- c) How can the area of the base (B) be expressed as a function of the height (h)?

$$B = \frac{75}{h} \quad \text{or} \quad B(h) = \frac{75}{h}$$

- 3) The rate at which a person is walking over a specific distance is inversely proportional to the time it takes for that person to walk that distance. Ms. Bishop's class went for a walk and everyone walked the same distance. It took Ms. Bishop 12 minutes and she walked at a rate of 35 yards per minute.

- a) How far did she walk?

$$12 \cdot 35 = 420$$

420 yards

- b) How long would it take a student to walk this distance if they walked at a rate of 40 yards per minute?

$$420 \div 40 = 10.5$$

$10\frac{1}{2}$ minutes

- c) Write a rule relating a person's time to walk this distance as a function of the rate at which they walked. Don't forget to label your variables and use function notation.

$$t(r) = \frac{420}{r}$$

t → time needed (mins)
 r → rate (yds per min)

4.)

Solve the following equations.

$$\frac{25}{x} = x$$

$$25 = x^2$$

$$\boxed{x = 5, -5}$$

$$\frac{9}{x} = 18$$

$$\frac{9}{18} = \frac{18x}{18}$$

$$\boxed{\frac{1}{2} = x}$$

$$x - 5 = \frac{+6}{x}$$

$$(x-5)x = +6$$

$$x^2 - 5x = +6$$

$$x^2 - 5x - 6 = 0$$

$$(x-6)(x+1) = 0 \quad \boxed{x = 6, -1}$$

$$x + 2 = \frac{8}{x}$$

$$x(x+2) = 8$$

$$x^2 + 2x = 8$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0 \quad \boxed{x = -4, 2}$$

$$2x + 7 = \frac{4}{x}$$

$$(2x+7)x = 4$$

$$2x^2 + 7x = 4$$

$$2x^2 + 7x - 4 = 0$$

multiply to -8
add to 7

$$(2x-1)(x+4) = 0$$

$$\boxed{x = \frac{1}{2}, -4}$$

	$2x$	-1
x	$2x^2$	$-x$
4	$8x$	-4

$$x + 4 = \frac{6}{x}$$

$$x(x+4) = 6$$

$$x^2 + 4x = 6$$

$$x^2 + 4x + 4 = 6 + 4$$

$$(x+2)^2 = 10$$

$$x+2 = \pm\sqrt{10}$$

$$\boxed{x = -\sqrt{10} - 2, +\sqrt{10} - 2}$$

$$3x - 13 = -\frac{4}{x}$$

$$x(3x-13) = -4$$

$$3x^2 - 13x = -4$$

$$3x^2 - 13x + 4 = 0$$

$$x = \frac{13 \pm \sqrt{13^2 - 4(3)(4)}}{2(3)}$$

$$x = \frac{13 \pm \sqrt{169 - 48}}{6}$$

$$x = \frac{13 \pm \sqrt{121}}{6}$$

$$x = \frac{13 \pm 11}{6}$$

$$\boxed{x = 4}$$

$$\boxed{x = \frac{1}{3}}$$

$$2(2x-1) = \frac{5}{x}$$

$$4x - 2 = \frac{5}{x}$$

$$4x^2 - 2x = 5$$

$$4x^2 - 2x - 5 = 0$$

$$x = \frac{2 \pm \sqrt{2^2 - 4(4)(-5)}}{2(4)}$$

$$x = \frac{2 \pm \sqrt{4 + 80}}{8}$$

$$x = \frac{2 \pm \sqrt{84}}{8} = \frac{2 \pm 2\sqrt{21}}{8} = \boxed{\frac{1 \pm \sqrt{21}}{4}}$$

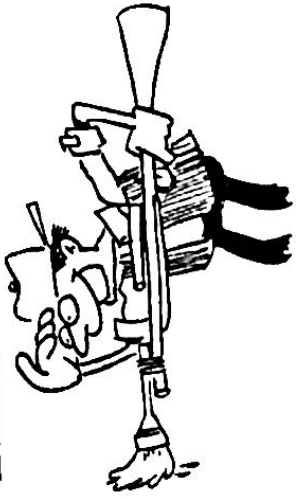
$$84 = 4 \cdot 21$$

$$2 \cdot 11$$

Work on back!

NAME:

KEY



Why Did the Painter Go On a Safari?

Cross out the letters above each correct answer. When you finish, the remaining letters will spell out the answer to the title question.

In Exercises 1-9, write an equation expressing inverse variation.

- y varies inversely with x , and $y = 16$ when $x = 3$. $y = 48/x$
- y varies inversely with x , and $y = 75$ when $x = 12$. $y = 900/x$
- y varies inversely with x , and $y = 5.6$ when $x = 0.8$. $y = 4.48/x$
- The time, t , it takes to travel a certain distance varies inversely with the speed, r . Suppose $t = 3.5$ h when $r = 60$ mph. $t = 210/r$
- y is inversely proportional to x , and $y = 2.9$ when $x = 170$. $y = 493/x$
- The force, F , needed to lift an object with a crowbar varies inversely with the length, L , of the crowbar. Suppose $F = 90$ lb when $L = 15$ in. $F = 1350/L$
- The number of chairs, y , on a ski lift is inversely proportional to the distance, x , between them. Suppose $y = 72$ when $x = 40$ m. $y = 2880/x$
- y is inversely proportional to x , and $y = 4.4$ when $x = 90$. $y = 396/x$
- y varies inversely as x , and $y = 6.25$ when $x = 0.16$. $y = 1/x$

TH	HE	LP	AT	WA	SO	WE	NT	ON	NE	ED	UP	TO
$y = \frac{396}{x}$	$y = \frac{3.8}{x}$	$F = \frac{1350}{L}$	$y = \frac{4.8}{x}$	$t = \frac{195}{r}$	$y = \frac{1}{x}$	$y = \frac{4.48}{x}$	$y = \frac{2680}{x}$	$y = \frac{960}{x}$	$t = \frac{210}{r}$	$y = \frac{2}{x}$	$y = \frac{193}{x}$	$F = \frac{875}{L}$

In Exercises 10-13, write an equation expressing inverse variation, then solve the problem. Cross out BOTH the equation and the solution.

- For rectangles with the same area, the length, ℓ , varies inversely with the width, w . Suppose a rectangle has a length of 105 ft and a width of 60 ft. Find the length of another rectangle with the same area whose width is 75 ft. 84 ft
- For piano strings under the same tension, the number of vibrations per second, f , is inversely proportional to the length of the string, L . Suppose a string that is 29.5 cm long vibrates 440 times per second. How long is a string that vibrates 264 times per second? ≈ 48.2 cm
- The time required to fill a swimming pool, t , varies inversely with the rate of water flow, r . Suppose it takes 96 minutes to fill the pool when the flow rate is 18 gallons per minute. How long will it take to fill the pool if the flow rate is 24 gallons per minute? 72 mins
- The current in an electrical circuit, I , varies inversely as the amount of resistance in the circuit, R . Suppose the current is 15 amps when the resistance is 24 ohms. Find the current when the resistance is 40 ohms. 9 amps

QU	SP	IT	IN	OT	LE	FT	ST	OP	AF	AR	KI	DS	SS
9 amps	$I = \frac{320}{R}$	$\ell = \frac{6300}{w}$	72 min	8 amps	74 min	$t = \frac{1728}{r}$	$f = \frac{12,980}{L}$	45.8 cm	$I = \frac{360}{R}$	92 ft	49.2 cm	$\ell = \frac{5400}{w}$	84 ft

HE WANTED TO SPOT LEOPARDS

$$xy = k \rightarrow y = \frac{k}{x}$$

$$\begin{aligned} \textcircled{1} \quad 16 \cdot 3 &= 48 \\ xy &= 48 \\ y &= \frac{48}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad 75 \cdot 12 &= 900 \\ xy &= 900 \\ y &= \frac{900}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 90 \cdot 4 \cdot 4 &= 396 \\ xy &= 396 \\ y &= \frac{396}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 0.8 \cdot 5.6 &= 4.48 \\ xy &= 4.48 \\ y &= \frac{4.48}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad 170 \cdot 2.9 &= 493 \\ xy &= 493 \\ y &= \frac{493}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad 0.16 \cdot 6.25 &= 1 \\ xy &= 1 \\ y &= \frac{1}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad t \cdot r &= k \\ 3.5 \cdot 60 &= 210 \\ t \cdot r &= 210 \\ t &= \frac{210}{r} \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad F \cdot L &= k \\ 90 \cdot 15 &= 1350 \\ F \cdot L &= 1350 \\ F &= \frac{1350}{L} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad y \cdot x &= k \\ 72 \cdot 40 &= 2880 \\ y &= \frac{2880}{x} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad l \cdot w &= k \\ 105 \cdot 60 &= 6300 \\ l \cdot w &= 6300 \\ l \cdot 75 &= 6300 \\ L &= 84 \\ L &= \frac{6300}{w} \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad I \cdot R &= k \\ 15 \cdot 24 &= 360 \\ I \cdot R &= 360 \\ I \cdot 40 &= 360 \\ I &= 9 \\ I &= \frac{360}{R} \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad f \cdot L &= k \\ 29.5 \cdot 440 &= 12,980 \\ f \cdot L &= 12,980 \\ 264 \cdot L &= 12,980 \\ L &= 49.1\bar{6} \\ f &= \frac{12,980}{L} \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad t \cdot r &= k \\ 96 \cdot 18 &= 1728 \\ t \cdot r &= 1728 \\ t \cdot 24 &= 1728 \\ t &= 72 \\ t &= \frac{1728}{r} \end{aligned}$$