

## Chapter 9 Exam Review

## Short Answer

- 1 Multiply or divide.

$$\frac{28x^2}{3y^3} \div \frac{2y^5}{10x^5} = \frac{2y^2}{5x}$$

- 2 Multiply or divide.

$$\frac{x^2}{(x+3)} \div \frac{x^2+8x+15}{x(x+2)} = \frac{x^2}{(x+3)} \cdot \frac{(x+3)(x+5)}{x(x+2)}$$

$$= \frac{x(x+5)}{(x+2)}$$

- 3 Multiply or divide.

$$\frac{d+5}{d-2} \div \frac{d+3}{d^2+2d-8}$$

$$\frac{(d+5)}{(d-2)} \cdot \frac{(d+4)(d-2)}{(d+3)}$$

$$= \frac{(d+5)(d+4)}{(d+3)}$$

- 4 Add or subtract. Simplify if possible.

$$\frac{6}{(d-7)} + \frac{5}{d^2-49}$$

$$= \frac{6(d+7)}{(d+7)(d-7)} + \frac{5}{(d+7)(d-7)} = \frac{6d+42+5}{(d+7)(d-7)}$$

$$\frac{6d+47}{(d+7)(d-7)}$$

- 5 Add or subtract. Factor and cancel at the end, if possible.

$$\frac{n^2+9n+14}{n^2-4n-12} - \frac{2}{(n-6)}$$

$$(n-6)(n+2)$$

$$\frac{n^2+9n+14}{(n-6)(n+2)} + \frac{-2(n+2)}{(n-6)(n+2)}$$

$$\frac{n^2+9n+14-2n-4}{(n-6)(n+2)} \Rightarrow \frac{n^2+7n+10}{(n-6)(n+2)}$$

Now, factor and cancel:

$$= \frac{(n+2)(n+5)}{(n-6)(n+2)} = \frac{(n+5)}{(n-6)}$$

6 Solve the equation.

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

Cross multiply:

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

$$\cancel{2x} - 4 = 4x + 4$$

$$\phantom{\cancel{2x}} - 2x \phantom{+ 4}$$


---


$$-4 = 2x + 4$$

$$-4 = 2x + 4$$

$$\phantom{-4} - 4 \phantom{+ 4}$$


---


$$-8 = 2x$$

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

$$x = -4$$

7 Solve the equation.

$$\frac{5 \cdot 4}{5 \cdot 3w} + \frac{4 \cdot 3}{5w \cdot 3} = \frac{-5}{1}$$

$$\frac{20}{15w} + \frac{12}{15w} = \frac{-75w}{15w}$$

$$20 + 12 = -75w$$

$$32 = -75w$$

$$\frac{32}{-75} = \frac{-75w}{-75}$$

$$w = -\frac{32}{75}$$

8 Solve the equation.

$$\frac{a}{(a^2-36)(a-b)} + \frac{2}{(a-6)(a+6)} = \frac{1}{(a+6)}$$

$$\frac{a}{\cancel{(a+b)(a-b)}(a-b)} + \frac{2(a+b)}{\cancel{(a+b)}(a-b)} = \frac{1(a-b)}{\cancel{(a+b)}(a-b)}$$

$$1a + 2a + 12 = 1a - 6$$

$$3a + 12 = 1a - 6$$

$$\phantom{3a} - 1a \phantom{+ 12}$$


---


$$2a + 12 = -6$$

$$\phantom{2a} - 12 \phantom{+ 12}$$


---


$$2a = -18$$

$$a = -9$$

9 Simplify the complex fraction

$$\frac{\frac{4}{(x+3)}}{\frac{1}{x} + \frac{3}{1}} = \frac{\frac{4}{(x+3)}}{\frac{(1+3x)}{x}} = \frac{4}{(x+3)} \cdot \frac{x}{(1+3x)} = \frac{4x}{(x+3)(1+3x)}$$

The pair of points is on the graph of a direct variation. Find the missing value.

10  $x_1, y_1, x_2, y_2$   
(2.4, 3) and (5, y)

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

$$\frac{3}{2.4} = \frac{y}{5}$$

$$\frac{2.4}{2.4} = \frac{15}{2.4}$$

$$y = 6.25$$

11  $x_1, y_1, x_2, y_2$   
(9, 5) and (x, 6)

$$\frac{5}{9} = \frac{6}{x}$$

$$\frac{5x}{9} = \frac{54}{9}$$

$$x = 10.8$$

- 12 The distance a spring will stretch varies directly with how much weight is attached to the spring. If a spring stretches 6 inches with 95 pounds attached, how far will it stretch with 75 pounds attached? Round to the nearest tenth of an inch.

$$\frac{6}{95} = \frac{x}{75}$$

$$95x = 450$$

$$\frac{95x}{95} = \frac{450}{95}$$

$$x = 4.7 \text{ in}$$

- 13 The time  $t$  required to drive a certain distance varies inversely with the speed  $r$ . If it takes 4 hours to drive the distance at 30 miles per hour, how long will it take to drive the same distance at 45 miles per hour?

$$x_1 y_1 = x_2 y_2$$

$$(4)(30) = 45t$$

$$120 = 45t$$

$$\frac{120}{45} = \frac{45t}{45}$$

$$t = 2.6 \text{ or } 2\frac{2}{3} \text{ hrs}$$

- 14 The values  $(6.4, 4)$  and  $(x, 12)$  are from an inverse variation. Find the missing value and round to the nearest hundredth.

$$(6.4)(4) = 12x$$

$$25.6 = 12x$$

$$\frac{25.6}{12} = \frac{12x}{12}$$

$$x = 2.13$$

- 15 A drama club is planning a bus trip to New York City to see a Broadway play. The cost per person for the bus rental varies inversely as the number of people going on the trip. It will cost \$26 per person if 68 people go on the trip. How much will it cost per person if 33 people go on the trip? Round your answer to the nearest cent, if necessary.

$$(26)(68) = 33x$$

$$1768 = 33x$$

$$\frac{1768}{33} = \frac{33x}{33}$$

$$x = \$53.58$$

- 16 Suppose that  $x$  and  $y$  vary inversely, and  $x = 7$  when  $y = 11$ . Write the function that models the inverse variation.

①  $K = xy$   
 $K = (7)(11)$   
 $K = 77$

②  $y = \frac{K}{x}$   
 $y = \frac{77}{x}$

Is the relationship between the variables in the table a direct variation, an inverse variation, or neither? If it is a direct or inverse variation, write a function to model it.

17

$x$	6	10	11	15
$y$	84	140	154	210

$$k = \frac{84}{6} = 14$$

$$k = \frac{140}{10} = 14$$

$$k = \frac{154}{11} = 14$$

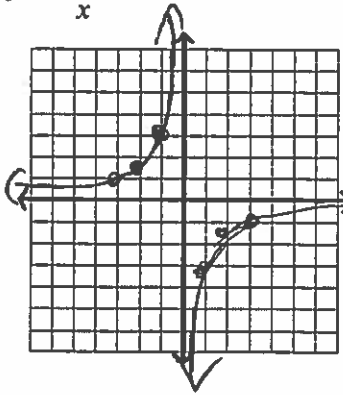
$$k = \frac{210}{15} = 14$$

Direct  $k = \frac{84}{6} = 14$

②  $y = kx$   
 $y = 14x$

Graph the function.

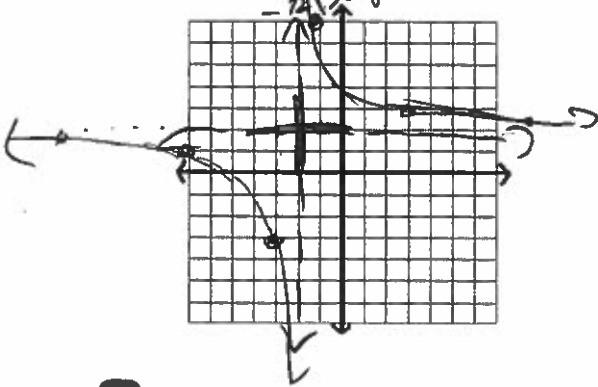
18  $y = \frac{-3}{x}$



x	y
-3	1
-2	1.5
-1	3
0	undefined
1	-3
2	-1.5
3	-1

Sketch the asymptotes and graph the function.

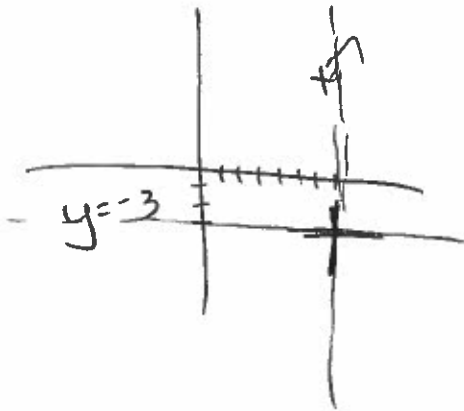
19  $y = \frac{5}{x+2} + 2$   
 up 2  
 left 2



Parent:  $y = \frac{5}{x}$

x	y
-10	-0.5
-5	-1
-1	-5
0	undefined
1	5
5	1
10	0.5

20 Write an equation for the translation of  $y = \frac{4}{x}$  that has the asymptotes  $x = 7$  and  $y = -3$ .



$$y = \frac{4}{x-7} - 3$$