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Algebra 2 - Chapter 8 Review for Test

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.

1.

x	–6	–4	–2	2
y	–48	–32	–16	16

Direct: $y = 8x$

2.

x	7	10	11	14
y	–14	–3	2	20

Neither

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

$y = \frac{77}{x}$ or $xy = 77$

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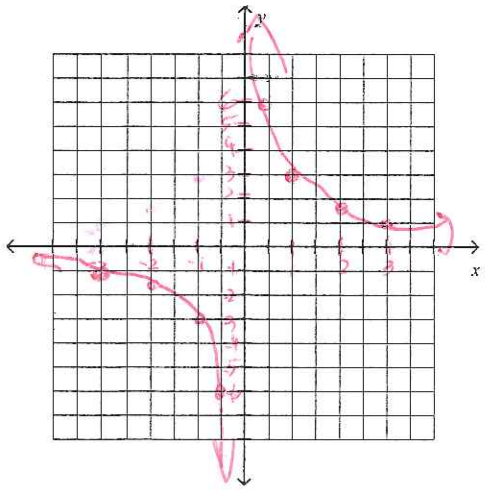
Graph the function.

4. $y = \frac{3}{x}$



x	y
-3	-1
-2	$-\frac{3}{2}$
-1	-3
$-\frac{1}{2}$	-6
0	und.
$\frac{1}{2}$	6
1	3
2	$\frac{3}{2}$
3	1

Simplify the rational expression. State any restrictions on the variable.

5. $\frac{w^2 + 12w + 32}{w + 4}$

$w+8$, $w \neq -4$

What is the product in simplest form? State any restrictions on the variable.

6. $\frac{8x^3}{4y^5} \cdot \frac{10y^3}{6x^5}$

$\frac{10}{3x^2y^2}$, $x \neq 0, y \neq 0$

7. $\frac{a^2}{a-5} \cdot \frac{a^2 - 9a + 20}{a^2 - 6a}$

$\frac{a^2-4a}{a-6}$, $a \neq 5, a \neq 0, a \neq 6$

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What is the quotient in simplified form? State any restrictions on the variable.

8. $\dfrac{p+4}{p-5} \div \dfrac{p+3}{p^2+p-30}$

$\dfrac{(p+4)(p+6)}{p+3}$, $p \neq 5, p \neq -3, p \neq -6$

9. Find the least common multiple of $x^2 - 3x + 2$ and $x^2 - 7x + 10$.

$(x-1)(x-2)(x-5)$

Simplify the sum.

10. $\dfrac{6}{d-3} + \dfrac{6}{d^2-9}$

$\dfrac{6d+24}{(d-3)(d+3)}$ $d \neq 3, d \neq -3$

Simplify the difference.

11. $\dfrac{q^2+3q-40}{q^2+12q+32} - \dfrac{10}{q+4}$

$\dfrac{q-15}{q+4}$, $q \neq -4, q \neq -8$

Simplify the complex fraction.

12. $\dfrac{\dfrac{z-5}{z^2-z-56}}{\dfrac{z-3}{z+7}}$

$\dfrac{z-5}{(z-3)(z-8)}$, $z \neq -7, z \neq 3, z \neq 8$

13. If R is the total resistance for a parallel circuit with two resistors of resistance r_1 and r_2, then $\frac{1}{R} = \frac{1}{r_1} + \frac{1}{r_2}$.

Find the resistance r_1 if the total resistance R is 35 ohms and r_2 is 85 ohms. Round your answer to the nearest ohm if necessary.

$\frac{1}{35} = \frac{1}{r_1} + \frac{1}{85}$

60 ohms.

Solve the equation. Check the solution.

14. $\frac{-3}{x+1} = \frac{-4}{x+5}$

$x = 11$

15. $\frac{d+1}{d-8} = \frac{d+2}{d-3}$

$d = -\frac{13}{4}$

16. $\frac{4}{a} + \frac{5}{3a} = 3$

$a = \frac{17}{9}$

17. Alicia can row 4 miles downstream in the same time it takes her to row 2 miles upstream. She rows downstream 4 miles/hour faster than she rows upstream. Find Alicia's rowing rate each way. Round your answers to the nearest tenth, if necessary.

8 mph downstream, 4 mph upstream

18. A group of college students are volunteering for Help the Homeless during their spring break. They are putting the finishing touches on a house they built. Working alone, Kaitlin can paint a certain room in 3 hours. Brianna can paint the same room in 7 hours. Write an equation that can be used to find how long it will take them working together to paint the room. How many hours will it take them to paint the room? If necessary, round your answer to the nearest hundredth.

$x = \frac{1}{\frac{1}{3} + \frac{1}{7}}$ $x = 2.1$

It will take about 2.1 hours to paint the room working together.