

1. Write a symbolic representation (formula) for $f(x)$ that adds 3 to x and divides the result by x . 1. _____

(a) $f(x) = x + \frac{3}{x}$ (b) $f(x) = \frac{x}{x-3}$ (c) $f(x) = \frac{x}{x+3}$ (d) $f(x) = \frac{x+3}{x}$

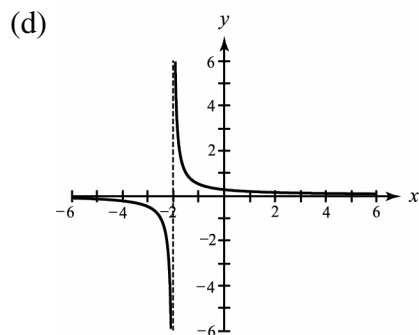
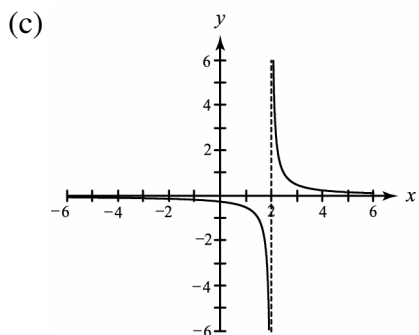
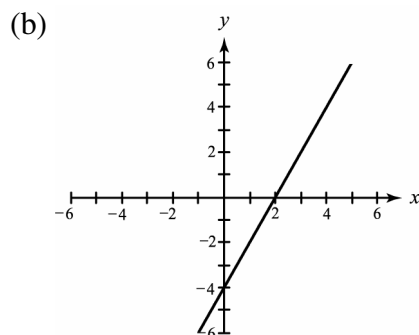
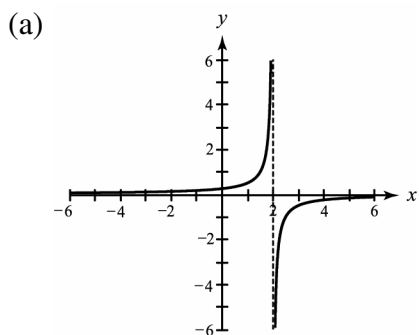
2. Let $f(x) = \frac{-1}{2x-4}$ and evaluate $f(1)$. 2. _____

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) $\frac{1}{4}$ (d) -1

3. Write the domain of $f(x) = \frac{-1}{2x-4}$ in set-builder notation. 3. _____

(a) $\{x \mid x \neq -\frac{1}{2}\}$ (b) $\{x \mid x \neq 2\}$ (c) $\{x \mid x \neq 0\}$ (d) $\{x \mid x \neq -4\}$

4. Graph $f(x) = \frac{-1}{2x-4}$. Show any vertical asymptotes as dashed lines. 4. _____



5. Simplify $\frac{3x^2 - 5x - 2}{2x^2 - x - 6}$. 5. _____

- (a) $\frac{3x-2}{2(x-3)}$ (b) $(x-2)^2$ (c) $\frac{3x+1}{2x+3}$ (d) Cannot be simplified.

6. Simplify $\frac{x^2-4}{x^2+4} \cdot \frac{x+2}{x-2}$. 6. _____

- (a) 1 (b) $\frac{(x+2)^2}{x^2+4}$ (c) $\frac{x-2}{x+2}$ (d) $-\frac{x+2}{x-2}$

7. Simplify $\frac{1}{9y^3} \div \frac{1}{3y^2}$. 7. _____

- (a) $3y$ (b) $\frac{1}{27y^5}$ (c) $27y^5$ (d) $\frac{1}{3y}$

8. Simplify $\frac{x}{x-3} - \frac{2}{x+3}$. 8. _____

- (a) $\frac{x^2+x-6}{(x-3)(x+3)}$ (b) $\frac{x-2}{(x-3)(x+3)}$ (c) $\frac{x-2}{x-3}$ (d) $\frac{x^2+x+6}{(x-3)(x+3)}$

9. Simplify $\frac{3}{x+2} - \frac{7}{(x+2)^2}$. 9. _____

- (a) $\frac{-4}{(x+2)^2}$ (b) $\frac{21}{(x+2)^2}$ (c) $\frac{3x-5}{(x+2)^2}$ (d) $\frac{3x-1}{(x+2)^2}$

10. Simplify $\frac{\frac{3}{x} - \frac{1}{x+3}}{\frac{2}{x} + \frac{5}{x+3}}$. 10. _____

- (a) $\frac{3x-1}{2x+5}$ (b) $\frac{2x+9}{7x+6}$ (c) $\frac{2}{7}$ (d) $\frac{2x-3}{7x+15}$

11. Solve $\frac{2}{2x+3} = 4$. 11. _____

- (a) $\frac{1}{4}$ (b) $-\frac{5}{2}$ (c) $-\frac{5}{4}$ (d) $\frac{3}{2}$

12. Solve $\frac{x+3}{2+x} - \frac{2x+5}{2+x} = 0$. 12. _____

- (a) -8 (b) 2 (c) -2 (d) no solutions

13. Solve $\frac{4}{4x^2-1} - \frac{3}{2x-1} = \frac{5}{2x+1}$. 13. _____

- (a) $-\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{8}$ (d) $\frac{3}{8}$

14. A triangle has sides with lengths 4, 5, and 8. Find the longest side of a similar triangle with a shortest side of length 6. 14. _____

- (a) 12 (b) 2 (c) 3 (d) 10

15. Suppose y varies inversely as x . If $y = 16$ when $x = 4$, find y when $x = 10$. 15. _____

- (a) $y = \frac{32}{5}$ (b) $y = 22$ (c) $y = \frac{24}{5}$ (d) $y = \frac{5}{2}$

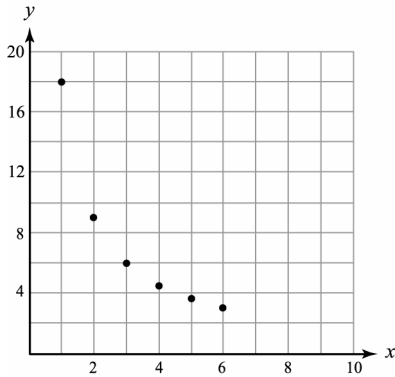
16. Use the table to determine whether the data represent direct or inverse variation. Find an equation that models the data. 16. _____

x	2	3	6	8
y	$\frac{4}{3}$	2	4	$\frac{16}{3}$

- (a) inverse variation; $y = \frac{4}{3x}$ (b) direct variation; $y = \frac{2}{3}x$
 (c) inverse variation; $y = \frac{3}{2x}$ (d) direct variation; $y = 1.5x$

17. Determine whether the data represent direct or inverse variation.
Find an equation that models the data.

17. _____



- (a) $y = \frac{18}{x}$ (b) $y = 6x$ (c) $y = \frac{1}{x}$ (d) $y = \frac{3x}{2}$
18. Divide $\frac{25b^3 + 15b}{5b}$. 18. _____

- (a) $8b^2$ (b) $5b^2 + 3$ (c) $5b^3 + 3b$ (d) $8b^3$

19. Divide $\frac{5x^3 - 12x^2 + 16}{x - 2}$. 19. _____

- (a) $\frac{5}{2}x^2 + 6x - 8$ (b) $5x^2 - 2x - 4 + \frac{8}{x - 2}$
- (c) $5x^2 - 22x + 60$ (d) $5x^2 - 2x + 12 + \frac{1}{x - 2}$

20. Suppose that one pump can drain a pool in 6 hours, and a second can drain the pool in 4 hours. How long will it take the two pumps, working together, to drain the pool?

20. _____

- (a) 5 hr (b) 10 hr (c) 2.4 hr (d) 1.5 hr