

**LESSON**  
**12-3**

**Practice A**  
**Simplifying Rational Expressions**

Find any excluded values for each rational expression.

1.  $\frac{2}{x-5}$

\_\_\_\_\_

2.  $\frac{4}{x^2+3x}$

\_\_\_\_\_

3.  $\frac{x+3}{x^2+6x+8}$

\_\_\_\_\_

Simplify each rational expression, if possible.

4.  $\frac{x+4}{x^2-16}$

$$\frac{x+4}{(\boxed{\phantom{00}})(\boxed{\phantom{00}})}$$

\_\_\_\_\_

5.  $\frac{3x-18}{x^2-36}$

$$\frac{3(\boxed{\phantom{00}})}{(\boxed{\phantom{00}})(\boxed{\phantom{00}})}$$

\_\_\_\_\_

6.  $\frac{x^2-1}{x^2+8x+7}$

$$\frac{(\boxed{\phantom{00}})(\boxed{\phantom{00}})}{(\boxed{\phantom{00}})(\boxed{\phantom{00}})}$$

\_\_\_\_\_

7.  $\frac{x+5}{x^2+7x+10}$

\_\_\_\_\_

8.  $\frac{x^2+4x-5}{x^2-4x+3}$

\_\_\_\_\_

9.  $\frac{x^2-2x}{x^2+2x-8}$

\_\_\_\_\_

10.  $\frac{3-x}{2x-6}$

$$\frac{-1(\boxed{\phantom{00}})}{2(\boxed{\phantom{00}})}$$

\_\_\_\_\_

11.  $\frac{x-4}{16-x^2}$

\_\_\_\_\_

12.  $\frac{8-x}{x^2-6x-16}$

\_\_\_\_\_

13. An animal's surface-area-to-volume ratio indicates the amount of heat loss the animal may experience. Because a smaller animal has a higher ratio of surface-area-to-volume, the smaller animal has a higher rate of heat loss.

a. Find the surface-area-to-volume ratio of a cube.

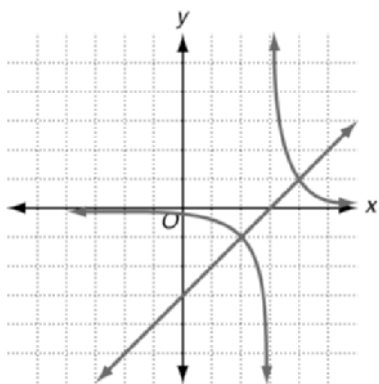
(Hint: For a cube,  $S = 6s$  and  $V = s^3$ .) \_\_\_\_\_

b. Two animals are both close to a cube in shape. The height of the first animal is 4 cm. The height of the second animal is 6 cm. Which animal would experience the greater amount of heat loss? Explain.

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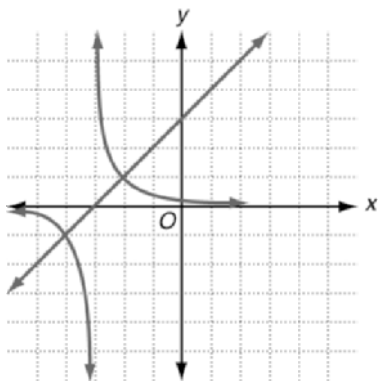
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4.



$$y = x - 3 \text{ and } y = \frac{1}{x - 3}$$

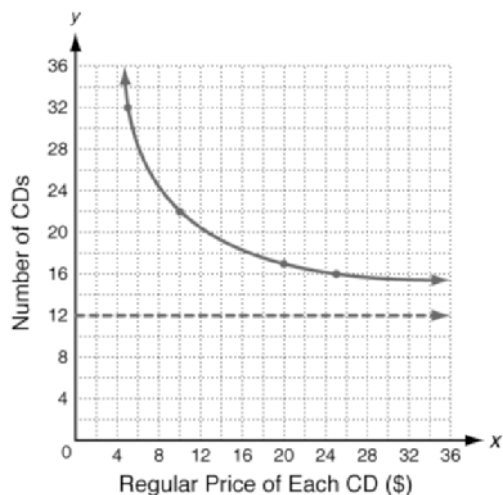
5.



$$y = x + 3 \text{ and } y = \frac{1}{x + 3}$$

### Problem Solving

- D:  $x > 0$ ; R: natural numbers greater than 12
- $x = 0$  and  $y = 12$
- 32; 22; 17; 16



- 17
- G
- B
- A

### Reading Strategies

- a. no; b. yes; c. yes
- It has no variable in the denominator.
- Find what value makes  $x - 5 = 0$ ; 5
- $x = 1$ ;  $y = 2$

### LESSON 12-3

#### Practice A

- 5
- 0; -3
- 4, -2
- $x + 4$ ;  $x - 4$ ;  $\frac{1}{x - 4}$
- $x - 6$ ;  $x + 6$ ;  $x - 6$ ;  $\frac{3}{x + 6}$
- $x + 1$ ;  $x - 1$ ;  $x + 1$ ;  $x + 7$ ;  $\frac{x - 1}{x + 7}$
- $\frac{1}{x + 2}$
- $\frac{x + 5}{x - 3}$
- $\frac{x}{x + 4}$
- $x - 3$ ;  $x - 3$ ;  $-\frac{1}{2}$
- $-\frac{1}{x + 4}$
- $-\frac{1}{x + 2}$
- a.  $\frac{6}{s^2}$

b. ratio for first animal:  $\frac{3}{8}$ ; ratio for

second animal:  $\frac{1}{6}$ ; the first animal would experience greater heat loss because its surface-area-to volume ratio is greater.

#### Practice B

- 3
- 0; 4
- 4, 1
- $\frac{7}{x - 3}$ ; 3
- $x + 2$ ; 0
- $\frac{1}{2x + 3}$ ; 0;  $-\frac{3}{2}$
- $\frac{1}{x - 5}$
- $\frac{3}{x + 1}$