

**PRETEST, FORM A**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
DATE \_\_\_\_\_

1. Identify all irrational numbers in the list.

$$\sqrt{7}, -\frac{10}{2}, 8, \pi, \sqrt{16}, 0, \frac{3}{4}, -20, -\frac{1}{3}$$

1. \_\_\_\_\_

Write in numerical order, from smallest to largest.

2.  $-\frac{7}{4}, \sqrt{4}, -|3|, -|-1|, |0|$

2. \_\_\_\_\_

3.  $-\left|\frac{2}{3}-1\right|, \sqrt{2}, \frac{1}{4}, -\sqrt{5}, -\frac{1}{2}, -\pi$

3. \_\_\_\_\_

4. Write without absolute value bars.

$$-|-2| - |-(4-5)|$$

4. \_\_\_\_\_

5. Write without exponents.  $5^{-3}$

5. \_\_\_\_\_

6. Simplify.  $\left(\frac{a^5b^{-3}}{a^{-2}b^7}\right)^{-3}$

6. \_\_\_\_\_

Perform the indicated operation.

7.  $(3x^3 + 5x - 8) - (2x^2 - 7x - 5)$

7. \_\_\_\_\_

8.  $(3x + y)(2x - 3y)$

8. \_\_\_\_\_

9.  $-3x^3(2x^2 + 4x - 9)$

9. \_\_\_\_\_

10.  $(9x - 5y)^2$

10. \_\_\_\_\_

Divide.

11.  $\frac{12x^4 + 24x^3 - 6x^2 - 12x}{6x^2}$

11. \_\_\_\_\_

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

12. \_\_\_\_\_

Factor completely.

13.  $64a^2 - 25b^2$

13. \_\_\_\_\_

14.  $6x^2 + 11x - 10$

14. \_\_\_\_\_

**PRETEST, FORM A**

Perform the indicated operations.

15.  $\frac{x^2 - 2xy + y^2}{6a^5b^8} \div \frac{x^2 - y^2}{2a^7b^3}$  15. \_\_\_\_\_

16.  $\frac{1}{2r} + \frac{4}{5s} - \frac{5}{6rs}$  16. \_\_\_\_\_

Simplify the expression. All variables represent positive numbers.

17.  $32^{-3/5}$  17. \_\_\_\_\_

18.  $\sqrt{12} + \sqrt{3} - \sqrt{27}$  18. \_\_\_\_\_

19.  $\frac{3}{\sqrt{18}}$  19. \_\_\_\_\_

20.  $\frac{15m^{-1/3}(3m^{5/6})}{5m^{-3/2}}$  20. \_\_\_\_\_

Solve the equation.

21.  $3y + 1 - (5y - 4) = y - 1$  21. \_\_\_\_\_

22.  $\sqrt{5x - 2} = \sqrt{x + 6}$  22. \_\_\_\_\_

23. Solve  $d = \frac{a + 3b}{2c}$  for  $b$ . 23. \_\_\_\_\_

24. A lot is in the shape of a rectangle with a perimeter of 44 meters. The length is 8 meters less than twice the width. Find the length of the lot. 24. \_\_\_\_\_

Solve the equation or inequality.

25.  $3y^2 - 2y = 8$  25. \_\_\_\_\_

26.  $2x - \frac{7}{6} + \frac{x}{6} = \frac{4x + 3}{6}$  26. \_\_\_\_\_

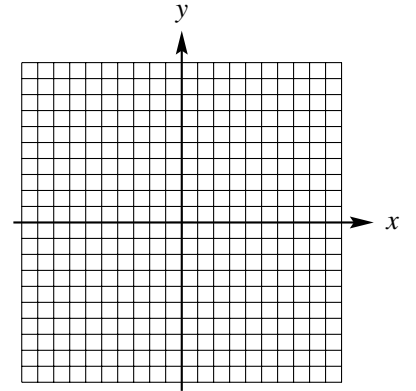
27.  $-5x + 3 \leq -2$  27. \_\_\_\_\_

**PRETEST, FORM A**

*Graph.*

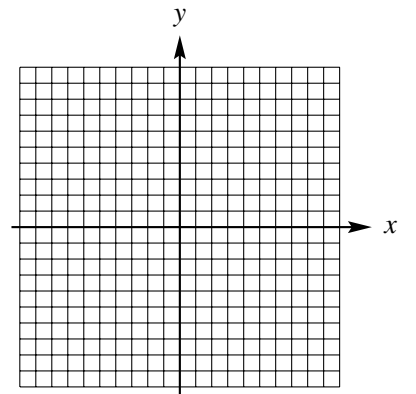
**28.**  $2x + y = 3$

**28.**



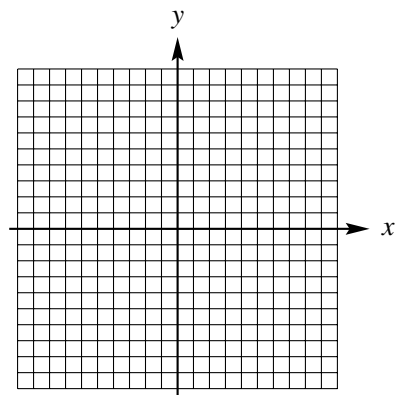
**29.**  $x = -5$

**29.**



**30.**  $y = x^2 + 3$

**30.**



**PRETEST, FORM B**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
DATE \_\_\_\_\_

Choose the best answer.

1. Identify all integers in the list. 1. \_\_\_\_\_  
 $\frac{7}{5}, -\sqrt{3}, 0, -14, \pi, \frac{15}{2}, 3, -1, \sqrt{49}$
- a.  $\pi, -1$                       b.  $0, -1, -14, 3, \sqrt{49}$   
c.  $-\sqrt{3}, \sqrt{49}$                 d.  $-\sqrt{3}, \pi, 0, 3$

Choose the smallest number in each group.

2. a.  $-|2|$                       b.  $-|-4|$  2. \_\_\_\_\_  
c.  $|-3|$                         d.  $|-1|$
3. a.  $-\frac{3}{2}$                         b.  $-\frac{4}{3}$  3. \_\_\_\_\_  
c.  $-\sqrt{1}$                         d.  $-\sqrt{2}$
4. Write without absolute value bars.  $-|-7| + |-1 - (-5)|$  4. \_\_\_\_\_
- a.  $-1$                             b.  $3$   
c.  $1$                              d.  $-3$
5. Write without exponents.  $6^{-3}$  5. \_\_\_\_\_
- a.  $-\frac{1}{36}$                         b.  $-18$   
c.  $\frac{1}{216}$                         d.  $\frac{1}{1296}$
6. Simplify.  $\left(\frac{3a^5b^{-3}}{6a^{-5}b^3}\right)^{-2}$  6. \_\_\_\_\_
- a.  $\frac{a^8}{4b^{14}}$                         b.  $\frac{4b^{12}}{a^{20}}$   
c.  $\frac{1}{a^{32}b^8}$                         d.  $a^{20}b^{12}$

Perform the indicated operation.

7.  $(5x^2 - 9x - 4) - (4x^3 - 2x^2 - 6)$  7. \_\_\_\_\_
- a.  $-4x^3 + 3x^2 - 9x - 10$     b.  $x^3 + 2x^2 - 9x + 2$   
c.  $-4x^3 + 7x^2 - 9x + 2$     d.  $x^3 - 2x^2 - 9x - 10$

**PRETEST, FORM B**

8.  $(5x-1)(2x+3)$  8. \_\_\_\_\_

- a.  $10x^2 + 13x$                       b.  $10x^2 + 13x - 3$   
c.  $10x^2 - 3$                          d.  $10x^2 - 13x + 3$

9.  $3a^3b^2(2a^5 - 5a^7b^8)$  9. \_\_\_\_\_

- a.  $5a^{15} - 8a^{21}b^{16}$                 b.  $6a^8b^2 - 15a^{10}b^{10}$   
c.  $6a^{15}b^2 - 15a^{21}b^{16}$             d.  $6a^8b^2 - 15a^4b^6$

10.  $(3a-2b)^2$  10. \_\_\_\_\_

- a.  $9a^2 - 12ab + 4b^2$                 b.  $9a^2 + 12ab - 4b^2$   
c.  $9a^2 - 4b^2$                          d.  $9a^2 - 12ab$

*Divide.*

11.  $\frac{10x^3 + 25x^2 + 30x - 20}{10x^2}$  11. \_\_\_\_\_

- a.  $x + \frac{5}{2} + \frac{x}{3} - \frac{x^2}{2}$                       b.  $x + \frac{5}{2} + \frac{30}{x} - \frac{10}{x^2}$   
c.  $x + \frac{5}{2} + \frac{3}{x} - \frac{2}{x^2}$                       d.  $x + \frac{2}{5} + \frac{30}{x} - \frac{10}{x^2}$

12.  $\frac{x^3 - 5x^2 + 6x - 8}{x - 4}$  12. \_\_\_\_\_

- a.  $x^2 - 5x + 6 - \frac{8}{x-4}$                       b.  $x^2 - 9x + 42 - \frac{176}{x-4}$   
c.  $x^2 - x + 2$                          d.  $x^2 - 9x + 2$

*Factor completely.*

13.  $3x^2 - 13x + 4$  13. \_\_\_\_\_

- a.  $(3x-1)(x-4)$                       b.  $(3x+1)(x+4)$   
c.  $(x-1)(3x-4)$                       d.  $(x-2)(3x-2)$

14.  $36a^2 - 49b^2$  14. \_\_\_\_\_

- a.  $(6a-7b)^2$                          b.  $(6a-7b)(6a+7b)$   
c.  $(3a-7b)(12a+7b)$                 d.  $(a+b)(36a-49b)$

**PRETEST, FORM B**

Perform the indicated operations.

15.  $\frac{4x^2 - y^2}{8a^3b} \div \frac{4x^2 + 4xy + y^2}{4ab^2}$  15. \_\_\_\_\_

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

16.  $\frac{4}{5x} + \frac{1}{10y} - \frac{5}{6xy}$  16. \_\_\_\_\_

- a. 0      b.  $\frac{24y + 3x - 25}{30xy}$   
c.  $24y + 3x - 25$       d.  $\frac{24y + 3x - 25}{15xy}$

Simplify the expression. All variables represent positive numbers.

17.  $3\sqrt{63} - 5\sqrt{28}$  17. \_\_\_\_\_

- a.  $-14\sqrt{3}$       b.  $\sqrt{7}$   
c.  $-\sqrt{7}$       d.  $-2\sqrt{35}$

18.  $\frac{-8}{\sqrt{24}}$  18. \_\_\_\_\_

- a.  $-\frac{8}{3}$       b.  $-\frac{\sqrt{24}}{3}$       c.  $-\frac{\sqrt{6}}{36}$       d.  $-\frac{2\sqrt{6}}{3}$

19.  $100^{-5/2}$  19. \_\_\_\_\_

- a. -250      b.  $\frac{1}{1000}$       c.  $\frac{1}{100000}$       d.  $-\frac{1}{1000}$

20.  $\frac{3m^{1/3}(4m^{-1/6})}{6m^{1/2}}$  20. \_\_\_\_\_

- a.  $2m^{2/3}$       b.  $2m^{1/3}$   
c.  $\frac{2}{m^{2/3}}$       d.  $\frac{2}{m^{1/3}}$

**PRETEST, FORM B**

*Solve the equation.*

21.  $2s + 5 - (4s - 9) = s + 2$  21. \_\_\_\_\_

- a.  $\left\{\frac{2}{3}\right\}$  b.  $\{4\}$   
c.  $\{-6\}$  d.  $\{-2\}$

22.  $\frac{2}{x+1} + \frac{1}{2} = \frac{1}{x+1}$  22. \_\_\_\_\_

- a.  $\{-3\}$  b.  $\left\{\frac{1}{4}\right\}$   
c.  $\{16\}$  d.  $\{-16\}$

23. Solve  $d = \frac{3a - b}{c}$  for  $a$ . 23. \_\_\_\_\_

- a.  $a = \frac{b + cd}{3}$  b.  $a = \frac{cd}{3b}$   
c.  $a = \frac{3 - cd}{b}$  d.  $a = \frac{b + cd}{3b}$

24. A lot is in the shape of a rectangle with a perimeter of 42 meters. The length is 3 meters more than twice the width. Find the length of the lot. 24. \_\_\_\_\_

- a. 18 meters b. 6 meters  
c. 15 meters d. 12 meters

*Solve the equation or inequality.*

25.  $5x^2 - 9x = 2$  25. \_\_\_\_\_

- a.  $\left\{-\frac{1}{5}, 2\right\}$  b.  $\left\{\frac{1}{10}, -2\right\}$   
c.  $\left\{-\frac{1}{10}, 2\right\}$  d.  $\left\{\frac{1}{5}, -\frac{1}{2}\right\}$

26.  $3\sqrt{2x} = \sqrt{15x + 24}$  26. \_\_\_\_\_

- a.  $\{8\}$  b.  $\left\{-\frac{8}{3}\right\}$   
c.  $\left\{-\frac{24}{11}\right\}$  d.  $\{2\}$

**PRETEST, FORM B**

27.  $-x \geq 3x - 18$

a.  $[9, \infty)$

b.  $(-\infty, 9]$

c.  $[\frac{9}{2}, \infty)$

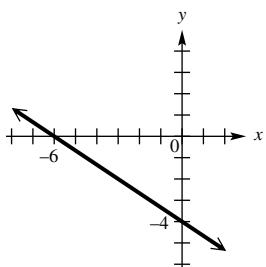
d.  $(-\infty, \frac{9}{2}]$

27. \_\_\_\_\_

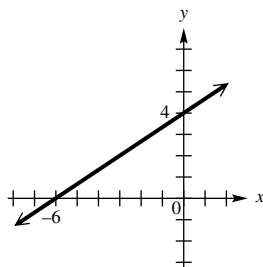
Graph the equation.

28.  $2x + 3y = -12$

a.

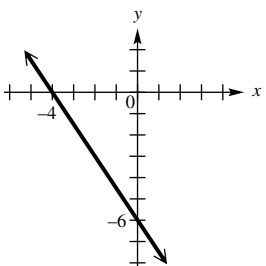


b.

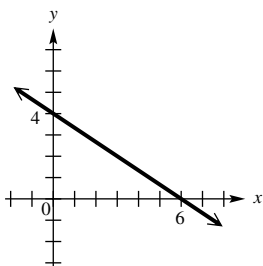


28. \_\_\_\_\_

c.

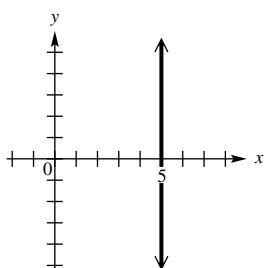


d.

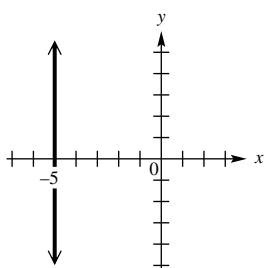


29.  $y = -5$

a.

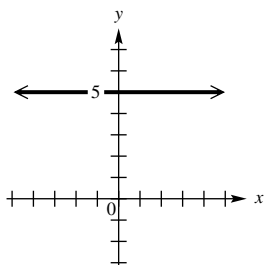


b.

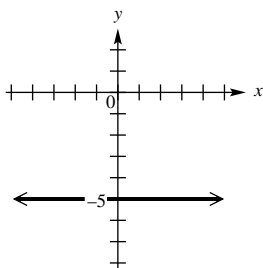


29. \_\_\_\_\_

c.



d.

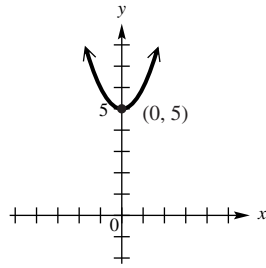




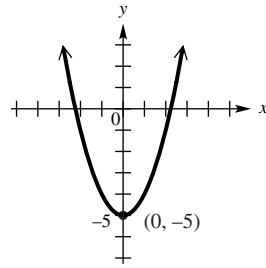
**PRETEST, FORM B**

**30.**  $y = x^2 - 5$

**a.**

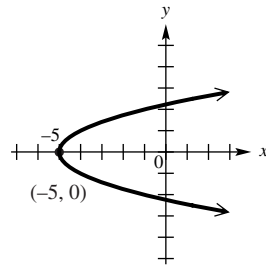


**b.**

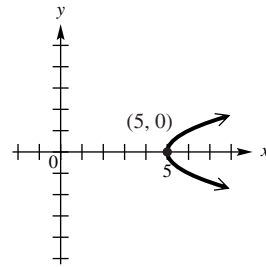


**30.** \_\_\_\_\_

**c.**



**d.**



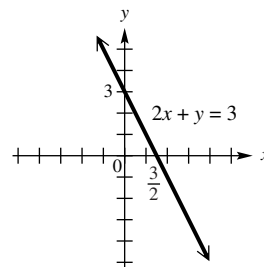
**ANSWERS TO PRETESTS**

**Form A**

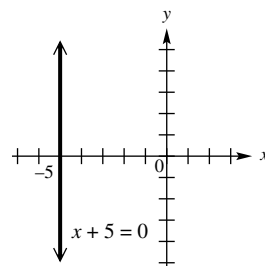
1.  $\sqrt{7}, \pi$
2.  $-|3|, -\frac{7}{4}, -|-1|, |0|, \sqrt{4}$
3.  $-\pi, -\sqrt{5}, -\frac{1}{2}, -\left|\frac{2}{3}-1\right|, \frac{1}{4}, \sqrt{2}$
4.  $-3$
5.  $\frac{1}{125}$
6.  $\frac{b^{30}}{a^{21}}$
7.  $3x^3 - 2x^2 + 12x - 3$
8.  $6x^2 - 7xy - 3y^2$
9.  $-6x^5 - 12x^4 + 27x^3$
10.  $81x^2 - 90xy + 25y^2$
11.  $2x^2 + 4x - 1 - \frac{2}{x}$
12.  $x^2 + x - 3$
13.  $(8a - 5b)(8a + 5b)$
14.  $(3x - 2)(2x + 5)$
15.  $\frac{a^2(x - y)}{3b^5(x + y)}$
16.  $\frac{15s + 24r - 25}{30rs}$
17.  $\frac{1}{8}$
18.  $0$
19.  $\frac{\sqrt{2}}{2}$

20.  $9m^2$
21.  $\{2\}$
22.  $\{2\}$
23.  $b = \frac{2cd - a}{3}$
24. 12 meters
25.  $\left\{-\frac{4}{3}, 2\right\}$
26.  $\left\{\frac{10}{9}\right\}$
27.  $[1, \infty)$

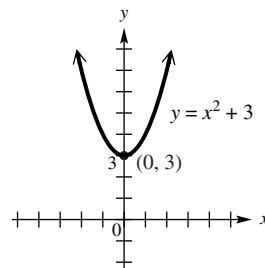
28.



29.



30.



**Form B**

- |       |       |
|-------|-------|
| 1. b  | 30. b |
| 2. b  |       |
| 3. a  |       |
| 4. d  |       |
| 5. c  |       |
| 6. b  |       |
| 7. c  |       |
| 8. b  |       |
| 9. b  |       |
| 10. a |       |
| 11. c |       |
| 12. c |       |
| 13. a |       |
| 14. b |       |
| 15. c |       |
| 16. b |       |
| 17. c |       |
| 18. d |       |
| 19. c |       |
| 20. d |       |
| 21. b |       |
| 22. a |       |
| 23. a |       |
| 24. c |       |
| 25. a |       |
| 26. a |       |
| 27. d |       |
| 28. a |       |
| 29. d |       |

# **CHAPTER TEST FORMS**



**CHAPTER R, FORM A**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
 DATE \_\_\_\_\_

1. Let  $A = \left\{ \frac{42}{6}, 0, \sqrt{7}, 2\sqrt{15}, -\frac{11}{5}, \sqrt{36}, -8.4, 2\pi \right\}$ .

List the elements of  $A$  that belong to the given set.

- a. Natural numbers
- b. Rational numbers
- c. Irrational numbers

- 1. a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

2. Evaluate the expression if  $x = -2$ ,  $y = -1$ , and  $z = 3$ :

$$\frac{-x^2 + 3|y|}{x(y + 2z)}$$

- 2. \_\_\_\_\_

3. Identify the property illustrated. Let  $a$ ,  $b$ , and  $c$  represent any real numbers.

a.  $4(a + b) = 4a + 4b$

b.  $\frac{2}{3} + \left(-\frac{2}{3}\right) = 0$

c.  $5(a + b) = 5(b + a)$

d.  $3(7a) = (3 \cdot 7)a$

- 3. a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

*Perform the indicated operations.*

4.  $-3(x^3 - x) + 2(x^2 + x) + 3(x^3 - 2x)$

5.  $(3x + 2y)(2x^2 - 3xy + 4y^2)$

6.  $[(3a + b) - 2]^2$

7.  $[(x - y) - 7][(x - y) + 7]$

8.  $(2x + 5)^3$

9.  $\frac{x^5 - 2x^3 - 3x^2 + 9}{x^3 - 2}$

10. During the years from 1930 to 1990, the number of lung cancer cases per 100,000 females in the year  $t$  (where  $t = 0$  corresponds to 1930) can be approximated by the polynomial  $.00028t^3 - .011t^2 + .23t + .93$ . According to this model, what was the number of lung cancer cases per 100,000 females in 1968? (Round to the nearest whole number.)

- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_

**CHAPTER R, FORM A**

*Factor completely.*

11.  $8x^2 + 22x - 21$

11. \_\_\_\_\_

12.  $8a^3 + 64b^3$

12. \_\_\_\_\_

13.  $6x^4 - 11x^3 - 35x^2$

13. \_\_\_\_\_

14.  $x^3y^2 - 4x^3 + 8y^2 - 32$

14. \_\_\_\_\_

*Perform the indicated operations.*

15.  $\frac{x^2 - 9}{x^2 - x} \cdot \frac{x - 1}{x^2 - 3x}$

15. \_\_\_\_\_

16.  $\frac{3x}{x - 4} - \frac{x}{x + 4} - \frac{3x + 1}{16 - x^2}$

16. \_\_\_\_\_

17.  $\frac{3a + 4b}{7a - 5b} - \frac{4a - 9b}{5b - 7a}$

17. \_\_\_\_\_

18.  $\frac{xy}{\frac{11}{x} + \frac{11}{y}}$

18. \_\_\_\_\_

19. Evaluate  $\left(\frac{125}{8}\right)^{-4/3}$ .

19. \_\_\_\_\_

20. Simplify  $\left(\frac{x^{2/3}y^{3/4}z^{-1/2}}{x^{-1/4}z^{-1/6}}\right)^{-6}$  so that there are no negative exponents. Assume that all variables represent positive real numbers.

20. \_\_\_\_\_

*Simplify. Assume that all variables represent positive real numbers.*

21.  $\sqrt{72x^9y^7z^4}$

21. \_\_\_\_\_

22.  $x\sqrt{112x} + 4\sqrt{175x^3}$

22. \_\_\_\_\_

23.  $(3 + 4\sqrt[3]{2})(5 - \sqrt[3]{4})$

23. \_\_\_\_\_

24. Rationalize the denominator of  $\frac{12}{5 - 2\sqrt{7}}$  and simplify.

24. \_\_\_\_\_

**CHAPTER R, FORM A**

25. The wind chill factor  $w$  is given by the equation

$$w = 91.4 - (91.4 - T)(.478 + .301\sqrt{v} - .02v),$$

where  $T$  represents the temperature in degrees Fahrenheit and  $v$  represents the wind velocity. Find the wind chill factor when the temperature is  $-40^\circ\text{F}$  and the wind velocity is 15 mph. (Round to the nearest tenth.)

25. \_\_\_\_\_

**CHAPTER R, FORM B**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
 DATE \_\_\_\_\_

1. Let  $A = \left\{ 17, \frac{2}{5}, 0, -\pi, -\frac{12}{3}, \sqrt{3}, -4.2, \sqrt{25} \right\}$

List the elements of  $A$  that belong to the given set.

a. Natural numbers

b. Integers

c. Irrational numbers

1. a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

2. Evaluate the expression if  $x = -2$ ,  $y = -1$ , and  $z = 3$ :

$$\frac{3|x + 2y|}{2y - z^2}$$

2. \_\_\_\_\_

3. Identify the property illustrated. Let  $a$ ,  $b$ , and  $c$  represent any real numbers.

a.  $\frac{1}{2} + \left(-\frac{1}{2} + b\right) = \left[\frac{1}{2} + \left(-\frac{1}{2}\right)\right] + b$

3. a. \_\_\_\_\_

b.  $(a + b)c = c(a + b)$

b. \_\_\_\_\_

c.  $2a + 0 = 2a$

c. \_\_\_\_\_

d.  $\frac{3}{4} \cdot \frac{4}{3} = 1$

d. \_\_\_\_\_

*Perform the indicated operations.*

4.  $x(x^2 - 1) - x^2(x + 2) - x(2x - 2)$

4. \_\_\_\_\_

5.  $(3x - 1)(2x^2 - x + 5)$

5. \_\_\_\_\_

6.  $[(3x - y) - 1]^2$

6. \_\_\_\_\_

7.  $[(x - 3) + y][(x - 3) - y]$

7. \_\_\_\_\_

8.  $(2x - 3y)^3$

8. \_\_\_\_\_

9.  $\frac{6x^4 - 7x^3 + 5x^2 - 11x}{3x - 2}$

9. \_\_\_\_\_

10. According to data supplied by the U.S. Department of Health and Human Services, the cumulative number of AIDS cases diagnosed in the United States can be approximated by the polynomial

$$2974.76(x - 2)^2 + 1563,$$

where  $x = 0$  corresponds to 1981, and so on. According to this model, what was the cumulative number of AIDS cases in 1999? (Round to the nearest hundred.)

10. \_\_\_\_\_



**CHAPTER R, FORM B***Factor completely.*

11.  $8x^2 - 10x - 3$  11. \_\_\_\_\_
12.  $(x - y)^3 + 27$  12. \_\_\_\_\_
13.  $98ab^2 + 28abc + 2ac^2$  13. \_\_\_\_\_
14.  $x^3y^3 - 16x^3y - y^3 + 16y$  14. \_\_\_\_\_

*Perform the indicated operations.*

15.  $\frac{3x^2 + 7x + 2}{x^2 + 2x} \cdot \frac{x^2 - x}{3x^2 + x}$  15. \_\_\_\_\_
16.  $\frac{2x}{x^2 - 25} - \frac{x + 1}{x^2 + 5x}$  16. \_\_\_\_\_
17.  $\frac{9x}{3x - 7} + \frac{21}{7 - 3x}$  17. \_\_\_\_\_
18.  $\frac{\frac{x}{x+2} - \frac{2}{x-1}}{\frac{3}{x+2} + \frac{x}{x-1}}$  18. \_\_\_\_\_
19. Evaluate  $\left(-\frac{27}{64}\right)^{-2/3}$ . 19. \_\_\_\_\_
20. Simplify  $\left(\frac{x^{3/2}y^{-4/3}z^{5/6}}{x^{2/3}y^{5/4}z^{-1/4}}\right)^6$  so that there are no negative exponents. Assume that all variables represent positive real numbers. 20. \_\_\_\_\_

*Simplify. Assume that all variables represent positive real numbers.*

21.  $\sqrt{75x^{16}y^7z^{10}}$  21. \_\_\_\_\_
22.  $2\sqrt{24x} - 5\sqrt{54x} + 8\sqrt{6x}$  22. \_\_\_\_\_
23.  $(3 + 4\sqrt[3]{25})(2 - 3\sqrt[3]{5})$  23. \_\_\_\_\_
24. Rationalize the denominator of  $\sqrt[3]{\frac{1}{2}} + \sqrt[3]{\frac{1}{16}}$  and simplify. 24. \_\_\_\_\_

**CHAPTER R, FORM B**

25. Police sometimes use the following procedure to estimate the speed at which a car was traveling at the time of an accident: A police officer drives a car that is the same type as the one involved in the accident under conditions similar to those during which the accident took place and then skids to a stop. If the car is driven at 30 mph, then the speed at the time of the accident is given by

$$s = 30\sqrt{\frac{a}{p}},$$

where  $a$  is the length of the skid marks left at the time of the accident and  $p$  is the length of the skid marks in the police test. Find  $s$ , the speed, when  $a$  is 475 ft and  $p$  is 122 ft. (Round to the nearest tenth.)

25. \_\_\_\_\_

**CHAPTER R, FORM C**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
 DATE \_\_\_\_\_

1. Let  $A = \left\{ \frac{70}{10}, -\frac{1}{8}, -2\pi, 0, \sqrt{64}, \sqrt{19}, 1.\overline{23}, -4, 2.76 \right\}$ .

List the elements of  $A$  that belong to the given set.

- a. Rational numbers
- b. Real numbers
- c. Whole numbers

- 1. a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

2. Evaluate the expression if  $x = -3$ ,  $y = -4$ , and  $z = 1$ :

$$\frac{|x| - 2|y|}{(x - 2z)^2}$$

- 2. \_\_\_\_\_

3. Identify the property illustrated. Let  $a$ ,  $b$ , and  $c$  represent any real numbers.

a.  $(a + b)c = ac + bc$

b.  $a + [b + (-b)] = a + 0$

c.  $\frac{1}{3}(m + 5) = (m + 5) \cdot \frac{1}{3}$

d.  $\left(\frac{1}{2} \cdot \frac{2}{3}\right) \cdot \frac{3}{4} = \frac{1}{2} \cdot \left(\frac{2}{3} \cdot \frac{3}{4}\right)$

- 3. a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

*Perform the indicated operations.*

4.  $(3x^2 - 2x - 5) - (2x^3 + x - 7) + 2x^2(x - 3)$

- 4. \_\_\_\_\_

5.  $(x^2 - x + 2)(2x - 3)$

- 5. \_\_\_\_\_

6.  $[(x - 4y) + 2]^2$

- 6. \_\_\_\_\_

7.  $[(a + 5) - 2b][(a + 5) + 2b]$

- 7. \_\_\_\_\_

8.  $(4b - 3c)^3$

- 8. \_\_\_\_\_

9.  $\frac{3y^4 - 5y^3 - 14y^2 + 10y}{y^2 - 2}$

- 9. \_\_\_\_\_

**CHAPTER R, FORM C**

10. According to data supplied by the U.S. Department of Health and Human Services, the cumulative number of AIDS cases diagnosed in the United States can be approximated by the polynomial  $2974.76(x - 2)^2 + 1563$ , where  $x = 0$  corresponds to 1981, and so on. According to this model, what was the cumulative number of AIDS cases in 1993? (Round to the nearest hundred.)

10. \_\_\_\_\_

*Factor completely.*

11.  $10x^2 - 19xy + 6y^2$   
 12.  $x^4 - 16$   
 13.  $2x^4 - 18x^2y^2$   
 14.  $a^3 + 2a^2b - 4ab^2 - 8b^3$

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

*Perform the indicated operations.*

15.  $\frac{2x^2 + x - 3}{3x^2 - 7x + 4} \div \frac{10x + 15}{3x^2 - x - 4}$

15. \_\_\_\_\_

16.  $\frac{x^2 + x - 20}{x^2 - 16} \cdot \frac{x^2 - 25}{x - 5}$

16. \_\_\_\_\_

17.  $\frac{3a + 4b}{7a - 5b} + \frac{10a - b}{5b - 7a}$

17. \_\_\_\_\_

18.  $\frac{\frac{2}{x} - 1}{\frac{4}{x^2} - 1}$

18. \_\_\_\_\_

19. Evaluate  $\left(\frac{81}{16}\right)^{-3/4}$ .

19. \_\_\_\_\_

20. Simplify  $\left(\frac{a^{-3/8}b^{-1/6}}{a^{5/4}b^{-2/3}c^{-3/4}}\right)^{-12}$  so that there are no negative exponents. Assume that all variables represent positive real numbers.

20. \_\_\_\_\_

*Simplify. Assume that all variables represent positive real numbers.*

21.  $\sqrt{80a^5b^{13}}$

21. \_\_\_\_\_

22.  $\sqrt[4]{768x^5} + \sqrt[4]{48x^5}$

22. \_\_\_\_\_

**CHAPTER R, FORM C**

23.  $(3\sqrt{x} + 2\sqrt{y})(3\sqrt{x} - 2\sqrt{y})$

23. \_\_\_\_\_

24. Rationalize the denominator of  $\frac{12}{\sqrt{3} + \sqrt{7}}$  and simplify.

24. \_\_\_\_\_

25. Police sometimes use the following procedure to estimate the speed at which a car was traveling at the time of an accident: A police officer drives a car that is the same type as the one involved in the accident under conditions similar to those during which the accident took place and then skids to a stop. If the car is driven at 30 mph, then the speed at the time of the accident is given by

25. \_\_\_\_\_

$$s = 30\sqrt{\frac{a}{p}},$$

where  $a$  is the length of the skid marks left at the time of the accident and  $p$  is the length of the skid marks in the police test. Find  $s$ , the speed, when  $a$  is 396 ft and  $p$  is 125 ft. (Round to the nearest tenth).

**CHAPTER R, FORM D**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
 DATE \_\_\_\_\_

1. Let  $A = \left\{ \sqrt{5}, -17.8, -3\bar{6}, 0, -\frac{10}{2}, \sqrt{49}, 3\pi, \frac{5}{3}, 8 \right\}$ .

List the elements of  $A$  that belong to the given set.

a. Natural numbers

b. Rational numbers

c. Integers

1. a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

2. Evaluate the expression if  $x = -3$ ,  $y = -4$ , and  $z = 1$ :

$$\frac{|2x + 5z|}{(2|x| - y)^2}$$

2. \_\_\_\_\_

3. Identify the property illustrated. Let  $a$ ,  $b$  and  $c$  represent any real numbers.

a.  $a(b + c) = (b + c)a$

b.  $\left(\frac{2}{7} \cdot \frac{1}{5}\right)b = \frac{2}{7} \cdot \left(\frac{1}{5}b\right)$

c.  $\frac{2}{7} \cdot 1 = \frac{2}{7}$

d.  $4[a + (-a)] = 4a + 4(-a)$

3. a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

Perform the indicated operations.

4.  $(4x^2 + 3x - 6) - (7x^3 - 2x^2 + 5) - 3x(2x^2 + 1)$

4. \_\_\_\_\_

5.  $(2x^2 - 3x + 1)(x^2 + x - 2)$

5. \_\_\_\_\_

6.  $[(2x - 3y) - 2]^2$

6. \_\_\_\_\_

7.  $[(r + 2s) - 4][(r + 2s) + 4]$

7. \_\_\_\_\_

8.  $(2x + 3y)^3$

8. \_\_\_\_\_

9.  $\frac{2y^4 - 2y^3 - 11y^2 + 6y}{y^2 - 3}$

9. \_\_\_\_\_

**CHAPTER R, FORM D**

10. During the years from 1930 to 1990, the number of lung cancer cases per 100,000 females in the year  $t$  (where  $t = 0$  corresponds to 1930) can be approximated by the polynomial  $.00028t^3 - .011t^2 + .23t + .93$ . According to this model, what was the number of lung cancer cases per 100,000 females in 1949? (Round to the nearest whole number.)

10. \_\_\_\_\_

*Factor completely.*

11.  $18x^2 - 27x + 4$

11. \_\_\_\_\_

12.  $6x^4 + 11x^2 - 10$

12. \_\_\_\_\_

13.  $12ab^3 - 3abc^2$

13. \_\_\_\_\_

14.  $r^4 - 8rs^3 - 2r^3s + 16s^4$

14. \_\_\_\_\_

*Perform the indicated operations.*

15.  $\frac{2x^2 - 11x + 15}{x^2 - 6x + 8} \div \frac{x^2 - x - 6}{x^2 - 2x - 8}$

15. \_\_\_\_\_

16.  $\frac{x - 4}{x^2 - 10x + 16} - \frac{x + 1}{x^2 + 5x - 14}$

16. \_\_\_\_\_

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

17. \_\_\_\_\_

18.  $\frac{\frac{y}{x^2} - \frac{x}{y^2}}{\frac{y}{x} - \frac{x}{y}}$

18. \_\_\_\_\_

19. Evaluate  $\left(-\frac{27}{125}\right)^{-2/3}$ .

19. \_\_\_\_\_

20. Simplify  $\left(\frac{a^{2/5}b^{-3/4}c^{-1/5}}{a^{1/2}c^{1/4}}\right)^{10}$  so that there are

20. \_\_\_\_\_

no negative exponents. Assume that all variables represent positive real numbers.

*Simplify. Assume that all variables represent positive real numbers.*

21.  $\sqrt{84a^{14}b^{18}c^5}$

21. \_\_\_\_\_

22.  $\sqrt[3]{16xy^4} + y\sqrt[3]{2xy} - \sqrt[3]{54xy^4}$

22. \_\_\_\_\_

**CHAPTER R, FORM D**

23.  $(\sqrt{10} + 2\sqrt{6})(\sqrt{10} - \sqrt{6})$

23. \_\_\_\_\_

24. Rationalize the denominator of  $\sqrt{\frac{1}{3}} - \sqrt{\frac{1}{27}}$  and simplify.

24. \_\_\_\_\_

25. The length of one leg of a right triangle is

25. \_\_\_\_\_

$$a = \sqrt{c^2 - b^2}$$

where  $c$  is the length of the hypotenuse and  $b$  is the length of the other leg. Find the length of the unknown leg if the length of the hypotenuse is 32 m and the length of the other leg is 17 m. (Round to the nearest tenth.)



**CHAPTER R, FORM E**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
 DATE \_\_\_\_\_

1. Let  $A = \left\{ \frac{5}{8}, -3.\bar{2}, \frac{\pi}{8}, -4, \sqrt{64}, \sqrt{3}, \frac{12}{2}, 0 \right\}$ .

List the elements of  $A$  that belong to the given set.

**A. Rational numbers**

a.  $\frac{5}{8}, -3.\bar{2}, -4, \sqrt{64}, \frac{12}{2}$

b.  $-4, \sqrt{64}, \frac{12}{2}, 0$

c.  $\frac{5}{8}, -4, \sqrt{64}, \frac{12}{2}, 0$

d.  $\frac{5}{8}, -3.\bar{2}, -4, \sqrt{64}, \frac{12}{2}, 0$

**B. Real numbers**

a.  $\frac{\pi}{8}, \sqrt{3}$

b.  $-4, \sqrt{64}, \frac{12}{2}, 0$

c.  $\frac{5}{8}, -3.\bar{2}, \frac{\pi}{8}, -4, \sqrt{64}, \sqrt{3}, \frac{12}{2}, 0$

d.  $-3.\bar{2}, \frac{\pi}{8}, \sqrt{3}$

**C. Natural numbers**

a.  $\frac{5}{8}, -3.\bar{2}, -4, \sqrt{64}, \frac{12}{2}, 0$

b.  $-4, \sqrt{64}, \frac{12}{2}, 0$

c.  $\sqrt{64}, \frac{12}{2}, 0$

d.  $\sqrt{64}, \frac{12}{2}$

1. **A.** \_\_\_\_\_

**B.** \_\_\_\_\_

**C.** \_\_\_\_\_

2. Evaluate the expression if  $x = -1$ ,  $y = 4$ , and  $z = -2$ :

$$\frac{|2x|z - x^2y}{|x - z^2|}$$

a.  $-\frac{8}{5}$

b. 0

c. -4

d. -2

2. \_\_\_\_\_

**CHAPTER R, FORM E**

**3.** Identify the property illustrated. Let  $a$  and  $b$  represent any real numbers.

**A.**  $\left(\frac{2}{5} + 0\right) \cdot \frac{2}{3} = \frac{2}{5} \cdot \frac{2}{3}$

- a.** Associative
- b.** Inverse
- c.** Identity
- d.** Commutative

**3.** **A.** \_\_\_\_\_

**B.**  $5(a + b) = 5(b + a)$

- a.** Commutative
- b.** Distributive
- c.** Identity
- d.** Associative

**B.** \_\_\_\_\_

**C.**  $4(2 + 3) = 4 \cdot 2 + 4 \cdot 3$

- a.** Distributive
- b.** Associative
- c.** Commutative
- d.** Inverse

**C.** \_\_\_\_\_

**D.**  $a + (-a) = 0$

- a.** Inverse
- b.** Identity
- c.** Associative
- d.** Distributive

**D.** \_\_\_\_\_

*Perform the indicated operations.*

**4.**  $(-3x^2 + 5x - 2) + 3x(2x^2 - x - 1) - (x^3 - 7)$

- a.**  $-x^2 + 2x + 5$
- b.**  $5x^3 - 6x^2 + 2x - 9$
- c.**  $-x^2 + 2x - 9$
- d.**  $5x^3 - 6x^2 + 2x + 5$

**4.** \_\_\_\_\_

**5.**  $(3s - 1)(s^2 - 4s + 2)$

- a.**  $3s^3 - 13s^2 - 10s - 2$
- b.**  $3s^3 - 13s^2 + 2s - 2$
- c.**  $3s^3 - 13s^2 + 10s - 2$
- d.**  $3s^3 - 13s^2 - 2s - 2$

**5.** \_\_\_\_\_

**6.**  $[(2a - b) + 7]^2$

- a.**  $4a^2 + b^2 + 49$
- b.**  $4a^2 - 4ab + b^2 + 28a - 14b + 49$
- c.**  $4a^2 - b^2 + 49$
- d.**  $4a^2 - 4ab + b^2 + 14a - 7b + 49$

**6.** \_\_\_\_\_

**7.**  $[(2s + t) - 3][(2s + t) + 3]$

- a.**  $4s^2 + t^2 - 9$
- b.**  $4s^2 + 4st + t^2 - 9$
- c.**  $4s^2 + 4st + t^2 + 9$
- d.**  $4s^2 + t^2 + 9$

**7.** \_\_\_\_\_

**8.**  $(4x - 3)^3$

- a.**  $64x^3 - 96x^2 + 72x - 27$
- b.**  $64x^3 - 27$
- c.**  $64x^3 - 144x^2 + 108x - 27$
- d.**  $64x^3 - 192x^2 + 144x - 27$

**8.** \_\_\_\_\_

**CHAPTER R, FORM E**

9.  $\frac{-2x^3 + 7x^2 - 7x + 12}{2x - 1}$

9. \_\_\_\_\_

a.  $-x^2 + 3x - 2 + \frac{14}{2x - 1}$

b.  $-x^2 + 4x - 11 + \frac{23}{2x - 1}$

c.  $-x^2 + 4x - 11 + \frac{1}{2x - 1}$

d.  $-x^2 + 3x - 2 + \frac{10}{2x - 1}$

10. The number of military personnel on active duty in the United States can be determined by the polynomial  $y = -7.66x^3 + 52.71x^2 - 93.43x + 2151$ , where  $x = 0$  corresponds to 1985 and  $y$  is in thousands. Based on this model, approximately how many military personnel were on active duty in 1989?

10. \_\_\_\_\_

- a. 2138 thousand  
c. 2044 thousand

- b. 2091 thousand  
d. 2130 thousand

*Factor completely.*

11.  $9x^2 - 18x + 8$

11. \_\_\_\_\_

a.  $(9x - 1)(x - 8)$

b.  $(9x - 2)(x - 4)$

c.  $(3x - 8)(3x - 1)$

d.  $(3x - 4)(3x - 2)$

12.  $27b^3 - 64$

12. \_\_\_\_\_

a.  $(3b - 4)(9b^2 + 12b + 16)$

b.  $(3b - 4)(9b^2 + 24b + 16)$

c.  $(3b + 4)(9b^2 - 12b + 16)$

d.  $(3b + 4)(9b^2 - 24b + 16)$

13.  $16t^4 - 80t^3 + 100t^2$

13. \_\_\_\_\_

a.  $4(2t^2 - 5)^2$

b.  $4(2t - 5)^4$

c.  $16(t - 5)^4$

d.  $4t^2(2t - 5)^2$

14.  $4x^2 - y^2 - 6y - 9$

14. \_\_\_\_\_

a.  $(4x - y + 3)(4x + y - 3)$

b.  $(2x - y + 3)(2x + y - 3)$

c.  $(2x - y - 3)(2x + y + 3)$

d.  $(4x - y - 3)(4x + y + 3)$

*Perform the indicated operations.*

15.  $\frac{x^2 - 9}{x^2 - 6x - 7} \cdot \frac{x^2 + 6x + 5}{x^2 - 9x + 18}$

15. \_\_\_\_\_

a.  $\frac{(x + 3)(x + 5)}{(x - 7)(x - 6)}$

b.  $\frac{(x + 1)(x + 5)}{(x - 7)(x - 2)}$

c.  $\frac{(x - 3)^2(x + 3)(x - 6)}{(x - 7)(x + 1)^2(x + 5)}$

d.  $\frac{x + 5}{(x - 7)(x - 1)(x - 6)}$

**CHAPTER R, FORM E**

16.  $\frac{2y-2}{y^2-4y} - \frac{y+8}{y^2-16}$

16. \_\_\_\_\_

a.  $\frac{3y^2+14y-8}{y(y-4)(y+4)}$

b.  $\frac{y^2+14y-8}{y(y-4)(y+4)}$

c.  $\frac{y+2}{y(y+4)}$

d.  $\frac{y-10}{2(y-4)(y+2)}$

17.  $\frac{20a-50b}{3a-7b} + \frac{2a-8b}{7b-3a}$

17. \_\_\_\_\_

a.  $\frac{58b-22a}{3a-7b}$

b.  $\frac{18a-58b}{3a-7b}$

c. 6

d.  $\frac{22a-58b}{3a-7b}$

18.  $\frac{\frac{4}{a^2} - \frac{1}{4}}{\frac{2}{a} - \frac{1}{2}}$

18. \_\_\_\_\_

a.  $\frac{3}{2a}$

b.  $\frac{3}{a-2}$

c.  $\frac{4+a}{2a}$

d.  $\frac{4a}{a-2}$

19. Evaluate  $\left(\frac{49}{25}\right)^{-3/2}$ .

19. \_\_\_\_\_

a.  $-\frac{125}{343}$

b.  $\frac{343}{125}$

c.  $\frac{125}{343}$

d.  $-\frac{343}{125}$

20. Simplify  $\left(\frac{x^{2/5}y^{1/4}z^{-3/4}}{x^{-3/4}y^{1/5}}\right)^{10}$  so that there are no negative exponents.

20. \_\_\_\_\_

Assume that all variables represent positive real numbers.

a.  $\frac{x^{23/2}y^{1/2}}{z^{15/2}}$

b.  $x^{23/20}y^{1/20}z^{37/4}$

c.  $\frac{y^{9/2}}{x^{7/2}z^{15/2}}$

d.  $x^{393/20}y^{409/20}z^{37/4}$

*Simplify. Assume that all variables represent positive real numbers.*

21.  $\sqrt[3]{56x^4y^{10}z^7}$

21. \_\_\_\_\_

a.  $2xy^3z^2\sqrt[3]{7xyz}$

b.  $2x^2y^5z^3\sqrt[3]{7z}$

c.  $2xy^3z^2\sqrt[3]{14xyz}$

d.  $2x^2y^5z^3\sqrt[3]{14z}$

22.  $\sqrt{3x} - 2\sqrt{12x} + 4\sqrt{18x}$

22. \_\_\_\_\_

a.  $9x\sqrt{6}$

b.  $\sqrt{3x} + 8\sqrt{2x}$

c.  $-3\sqrt{3x} + 12\sqrt{2x}$

d.  $9\sqrt{3x}$

**CHAPTER R, FORM E**

23.  $(\sqrt{10} + 2\sqrt{5})^2$  23. \_\_\_\_\_

a. 30

b.  $30 + 20\sqrt{2}$

c.  $30 + 10\sqrt{2}$

d. 20

24. Rationalize the denominator of  $\frac{15}{2\sqrt{7} - \sqrt{10}}$ . 24. \_\_\_\_\_

a.  $\frac{5(2\sqrt{7} - \sqrt{10})}{6}$

b.  $\frac{15(2\sqrt{7} + \sqrt{10})}{4}$

c.  $\frac{5(2\sqrt{7} + \sqrt{10})}{6}$

d.  $\frac{15(2\sqrt{7} - \sqrt{10})}{4}$

25. One of the two solutions of a quadratic equation,  $x$ , can be found by the formula 25. \_\_\_\_\_

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a},$$

where  $a$  is the coefficient of the squared term,  $b$  is the coefficient of the linear term, and  $c$  is the constant term. Find one of the solutions if  $a = 5$ ,  $b = -7$ , and  $c = -6$ .

a.  $\frac{7 + \sqrt{71}}{10}$

b.  $-\frac{4}{5}$

c.  $\frac{7 - \sqrt{71}}{10}$

d. 2

**CHAPTER R, FORM F**  
**COLLEGE ALGEBRA AND TRIGONOMETRY**

NAME \_\_\_\_\_  
DATE \_\_\_\_\_

1. Let  $B = \left\{ \sqrt{10}, -1.5\overline{5}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14} \right\}$ .

List the elements of  $B$  that belong to the given set.

**A.** Irrational numbers

1. **A.** \_\_\_\_\_

**a.**  $\sqrt{10}, -1.5\overline{5}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14}$     **b.**  $\sqrt{10}, -1.5\overline{5}, -\pi, \sqrt{64}, 0$

**c.**  $\sqrt{10}, -\pi, 0$     **d.**  $\sqrt{10}, -\pi$

**B.** Natural numbers

**B.** \_\_\_\_\_

**a.**  $12, \frac{15}{5}, \sqrt{64}, 0$     **b.**  $12, \frac{15}{5}, \sqrt{64}$

**c.**  $12, \frac{15}{5}, 0, -1.5\overline{5}, \sqrt{64}$     **d.**  $12, \frac{15}{5}$

**C.** Integers

**C.** \_\_\_\_\_

**a.**  $12, \frac{15}{5}, \sqrt{64}$     **b.**  $12, \frac{15}{5}, \sqrt{64}, 0$

**c.**  $12, \frac{15}{5}$     **d.**  $12, \frac{15}{5}, 0, -1.5\overline{5}, \sqrt{64}, \frac{5}{14}$

2. Evaluate the expression if  $x = -2$ ,  $y = 1$ , and  $z = -1$ :

2. \_\_\_\_\_

$$\frac{|3x + y|}{|z| - 2x^2}$$

**a.**  $\frac{5}{7}$     **b.**  $-\frac{1}{3}$     **c.**  $-\frac{5}{7}$     **d.**  $\frac{1}{3}$