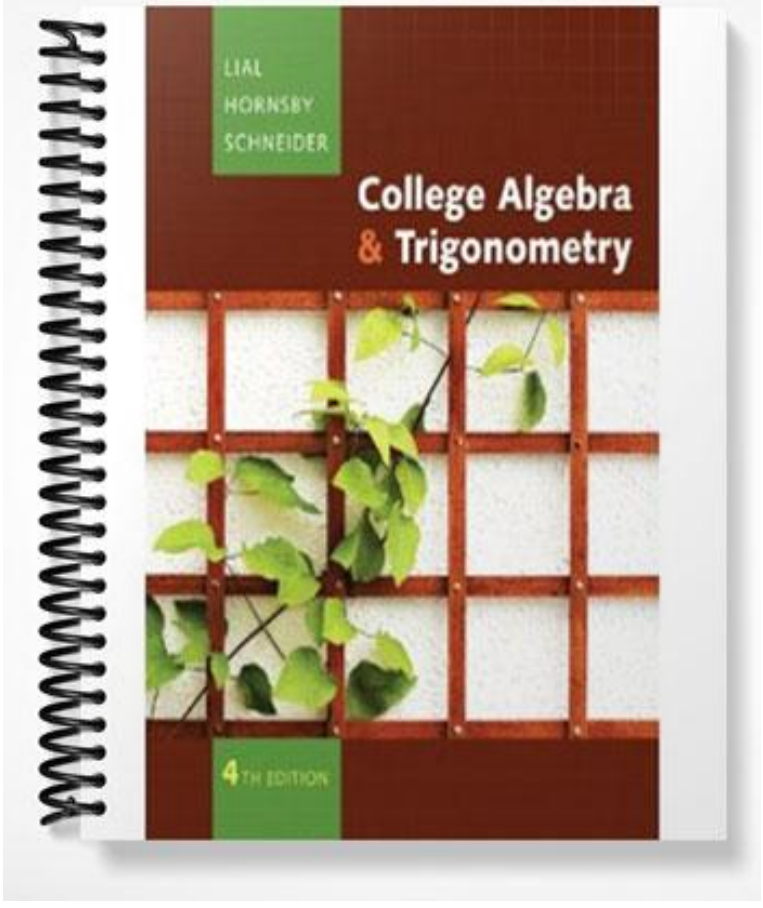
TEST BANK


LIAL
HORNSBY
SCHNEIDER
College Algebra
& Trigonometry
4TH EDITION

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

16. $\dfrac{1}{2r}+\dfrac{4}{5s}-\dfrac{5}{6rs}$ **16.** _____

Simplify the expression. All variables represent positive numbers.

17. $32^{-3/5}$ **17.** _____

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

19. $\dfrac{3}{\sqrt{18}}$ **19.** _____

20. $\dfrac{15m^{-1/3}\left(3m^{5/6}\right)}{5m^{-3/2}}$ **20.** _____

Solve the equation.

21. $3y+1-\left(5y-4\right)=y-1$ **21.** _____

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

23. Solve $d=\dfrac{a+3b}{2c}$ 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. $2x-\dfrac{7}{6}+\dfrac{x}{6}=\dfrac{4x+3}{6}$ **26.** _____

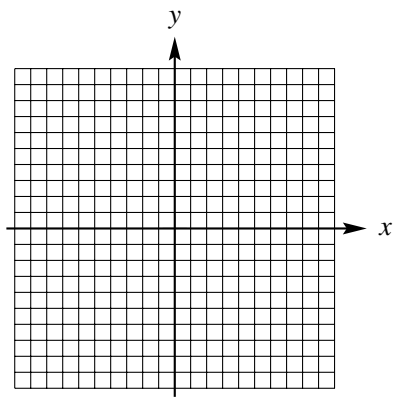
27. $-5x+3\le -2$ **27.** _____

PRETEST, FORM A

Graph.

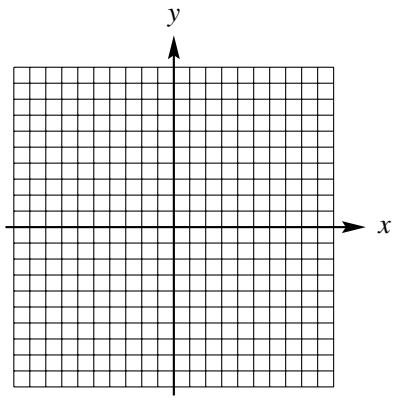
28. $2x + y = 3$

28.



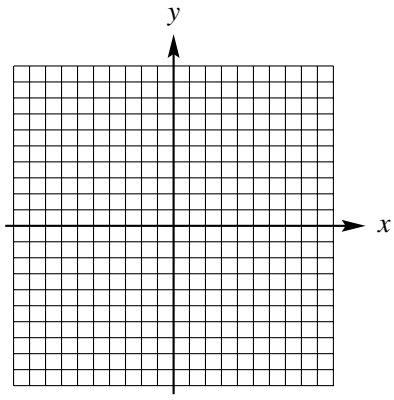
29. $x = -5$

29.



30. $y = x^2 + 3$

30.



PRETEST, FORM B NAME_____
COLLEGE ALGEBRA AND TRIGONOMETRY 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.** $x^3-2x^2-9x-10$

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. $3a^3b^2\left(2a^5-5a^7b^8\right)$ **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. $\dfrac{10x^3+25x^2+30x-20}{10x^2}$ **11.** _____

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

12. $\dfrac{x^3-5x^2+6x-8}{x-4}$ **12.** _____

a. $x^2-5x+6-\dfrac{8}{x-4}$ **b.** $x^2-9x+42-\dfrac{176}{x-4}$
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. $\dfrac{4x^2-y^2}{8a^3b} \div \dfrac{4x^2+4xy+y^2}{4ab^2}$ **15.** _____

a. $\dfrac{2a^2(2x+y)}{b(2x-y)}$ **b.** $\dfrac{2a^2(2x-y)}{b(2x+y)}$

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

16. $\dfrac{4}{5x}+\dfrac{1}{10y}-\dfrac{5}{6xy}$ **16.** _____

a. 0 **b.** $\dfrac{24y+3x-25}{30xy}$

c. $24y+3x-25$ **d.** $\dfrac{24y+3x-25}{15xy}$

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. $\dfrac{-8}{\sqrt{24}}$ **18.** _____

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

19. $100^{-5/2}$ **19.** _____

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

20. $\dfrac{3m^{1/3}\left(4m^{-1/6}\right)}{6m^{1/2}}$ **20.** _____

a. $2m^{2/3}$ **b.** $2m^{1/3}$

c. $\dfrac{2}{m^{2/3}}$ **d.** $\dfrac{2}{m^{1/3}}$

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.** $\{2\}$

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

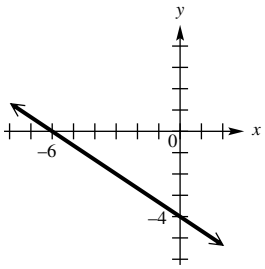
a. $[9, \infty)$ **b.** $(-\infty, 9]$

c. $\left[\frac{9}{2}, \infty\right)$ **d.** $\left(-\infty, \frac{9}{2}\right]$

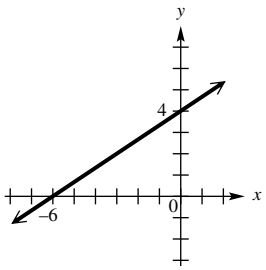
Graph the equation.

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

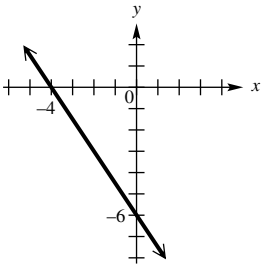
a.



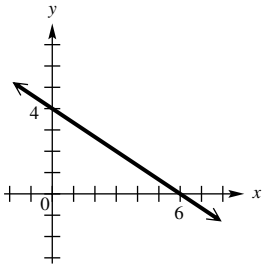
b.



c.

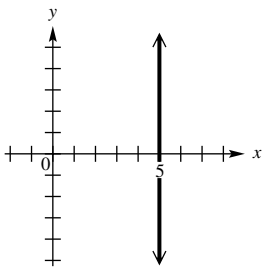


d.

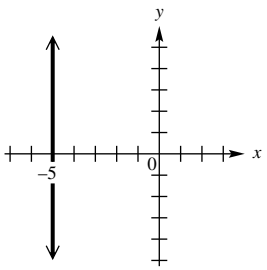


29. $y = -5$ **29.** _____

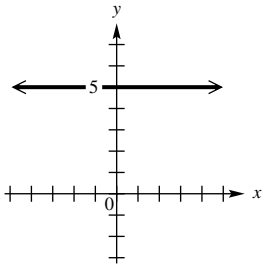
a.



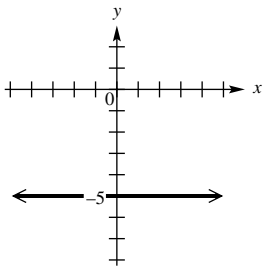
b.



c.

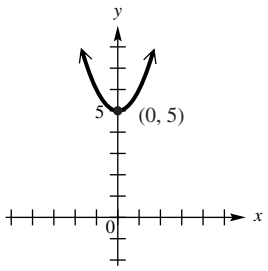


d.

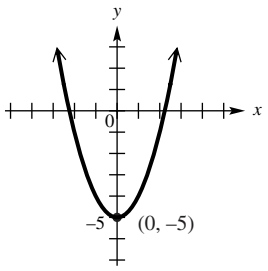


30. $y = x^2 - 5$

a.

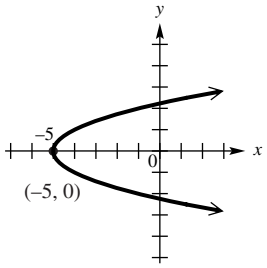


b.

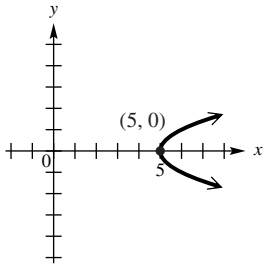


30. _____

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

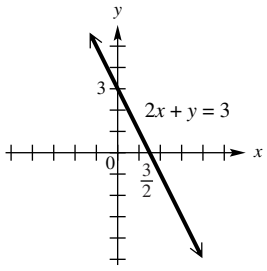
24. 12 meters

25. $\left\{-\frac{4}{3}, 2\right\}$

26. $\left\{\frac{10}{9}\right\}$

27. $[1, \infty)$

28.



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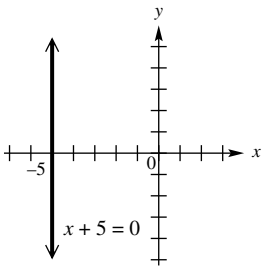

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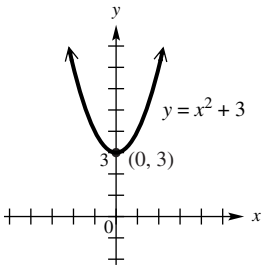

Form B

1. 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

30. b

CHAPTER TEST FORMS

1. Let $A=\left\{\frac{42}{6},\ 0,\ \sqrt{7},\ 2.\overline{15},\ -\frac{11}{5},\ \sqrt{36},\ -8.4,\ 2\pi\right\}$.
List the elements of A that belong to the given set.

a. Natural numbers **1. a.** _____

b. Rational numbers **b.** _____

c. Irrational numbers **c.** _____

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

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

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

a. $4(a+b)=4a+4b$ **3. a.** _____

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

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

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

Perform the indicated operations.

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

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

6. $\left[(3a+b)-2\right]^2$ **6.** _____

7. $\left[(x-y)-7\right]\left[(x-y)+7\right]$ **7.** _____

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

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

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.) **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. $\dfrac{x^2-9}{x^2-x} \cdot \dfrac{x-1}{x^2-3x}$ **15.** _____

16. $\dfrac{3x}{x-4} - \dfrac{x}{x+4} - \dfrac{3x+1}{16-x^2}$ **16.** _____

17. $\dfrac{3a+4b}{7a-5b} - \dfrac{4a-9b}{5b-7a}$ **17.** _____

18. $\dfrac{xy}{\dfrac{11}{x} + \dfrac{11}{y}}$ **18.** _____

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

20. Simplify $\left(\dfrac{x^{2/3}y^{3/4}z^{-1/2}}{x^{-1/4}z^{-1/6}}\right)^{-6}$ 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. $\left(3 + 4\sqrt[3]{2}\right)\left(5 - \sqrt[3]{4}\right)$ **23.** _____

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

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°F and the wind velocity is 15 mph. (Round to the nearest tenth.)

25. _____

CHAPTER R, FORM B NAME_____
COLLEGE ALGEBRA AND TRIGONOMETRY DATE_____

1. Let $A = \left\{17, \frac{2}{5}, 0, -\pi, -\frac{12}{3}, \sqrt{3}, -4.\overline{2}, \sqrt{25}\right\}$

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

a. Natural numbers **1. a.** _____

b. Integers **b.** _____

c. Irrational numbers **c.** _____

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

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

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. $\dfrac{3x^2+7x+2}{x^2+2x}\cdot\dfrac{x^2-x}{3x^2+x}$ **15.** _____

16. $\dfrac{2x}{x^2-25}-\dfrac{x+1}{x^2+5x}$ **16.** _____

17. $\dfrac{9x}{3x-7}+\dfrac{21}{7-3x}$ **17.** _____

18. $\dfrac{\dfrac{x}{x+2}-\dfrac{2}{x-1}}{\dfrac{3}{x+2}+\dfrac{x}{x-1}}$ **18.** _____

19. Evaluate $\left(-\dfrac{27}{64}\right)^{-2/3}$. **19.** _____

20. Simplify $\left(\dfrac{x^{3/2}y^{-4/3}z^{5/6}}{x^{2/3}y^{5/4}z^{-1/4}}\right)^6$ 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. $\left(3+4\sqrt[3]{25}\right)\left(2-3\sqrt[3]{5}\right)$ **23.** _____

24. Rationalize the denominator of $\sqrt[3]{\dfrac{1}{2}}+\sqrt[3]{\dfrac{1}{16}}$ 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

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

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 NAME_____
COLLEGE ALGEBRA AND TRIGONOMETRY 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 **1. a.** _____

b. Real numbers **b.** _____

c. Whole numbers **c.** _____

2. Evaluate the expression if $x=-3$, $y=-4$, and $z=1$: **2.** _____
$$\frac{|x|-2|y|}{(x-2z)^2}$$

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

a. $(a+b)c=ac+bc$ **3. a.** _____

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

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

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

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. $10x^2-19xy+6y^2$ **11.** _____

12. x^4-16 **12.** _____

13. $2x^4-18x^2y^2$ **13.** _____

14. $a^3+2a^2b-4ab^2-8b^3$ **14.** _____

Perform the indicated operations.

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

16. $\dfrac{x^2+x-20}{x^2-16}\cdot\dfrac{x^2-25}{x-5}$ **16.** _____

17. $\dfrac{3a+4b}{7a-5b}+\dfrac{10a-b}{5b-7a}$ **17.** _____

18. $\dfrac{\dfrac{2}{x}-1}{\dfrac{4}{x^2}-1}$ **18.** _____

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

20. Simplify $\left(\dfrac{a^{-3/8}b^{-1/6}}{a^{5/4}b^{-2/3}c^{-3/4}}\right)^{-12}$ 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.** _____

23. $\left(3\sqrt{x}+2\sqrt{y}\right)\left(3\sqrt{x}-2\sqrt{y}\right)$ **23.** _____

24. Rationalize the denominator of $\dfrac{12}{\sqrt{3}+\sqrt{7}}$ 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 NAME_____
COLLEGE ALGEBRA AND TRIGONOMETRY DATE_____

1. Let $A=\left\{\sqrt{5},\ -17.8,\ -3.\overline{6},\ 0,\ -\frac{10}{2},\ \sqrt{49},\ 3\pi,\ \frac{5}{3},\ 8\right\}$.
List the elements of A that belong to the given set.

a. Natural numbers **1. a.** _____

b. Rational numbers **b.** _____

c. Integers **c.** _____

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

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

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

a. $a(b+c)=(b+c)a$ **3. a.** _____

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

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

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

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. $\dfrac{2x^2 - 11x + 15}{x^2 - 6x + 8} \div \dfrac{x^2 - x - 6}{x^2 - 2x - 8}$ **15.** _____

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

17. $\dfrac{x+3}{x^2 - 4} + \dfrac{2x+5}{4 - x^2}$ **17.** _____

18. $\dfrac{\dfrac{y}{x^2} - \dfrac{x}{y^2}}{\dfrac{y}{x} - \dfrac{x}{y}}$ **18.** _____

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

20. Simplify $\left(\dfrac{a^{2/5}b^{-3/4}c^{-1/5}}{a^{1/2}c^{1/4}}\right)^{10}$ 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. $\sqrt{84a^{14}b^{18}c^5}$ **21.** _____

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

23. $\left(\sqrt{10}+2\sqrt{6}\right)\left(\sqrt{10}-\sqrt{6}\right)$ **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 $a=\sqrt{c^2-b^2}$ 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.) **25.** _____

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

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

A. Rational numbers **1. A.** _____

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

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

B. Real numbers **B.** _____

a. $\frac{\pi}{8}, \sqrt{3}$ **b.** $-4, \sqrt{64}, \frac{12}{2}, 0$

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

C. Natural numbers **C.** _____

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

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

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

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

a. $-\frac{8}{5}$ **b.** 0 **c.** -4 **d.** -2

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

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

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

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

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

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

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

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

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

Perform the indicated operations.

4. $\left(-3x^2+5x-2\right)+3x\left(2x^2-x-1\right)-\left(x^3-7\right)$ **4.** _____

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

5. $(3s-1)\left(s^2-4s+2\right)$ **5.** _____

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

6. $\left[(2a-b)+7\right]^2$ **6.** _____

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

7. $\left[(2s+t)-3\right]\left[(2s+t)+3\right]$ **7.** _____

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

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

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

9. $\dfrac{-2x^3+7x^2-7x+12}{2x-1}$ **9.** _____

a. $-x^2+3x-2+\dfrac{14}{2x-1}$ **b.** $-x^2+4x-11+\dfrac{23}{2x-1}$

c. $-x^2+4x-11+\dfrac{1}{2x-1}$ **d.** $-x^2+3x-2+\dfrac{10}{2x-1}$

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 **b.** 2091 thousand
c. 2044 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. $\dfrac{x^2-9}{x^2-6x-7}\cdot\dfrac{x^2+6x+5}{x^2-9x+18}$ **15.** _____

a. $\dfrac{(x+3)(x+5)}{(x-7)(x-6)}$ **b.** $\dfrac{(x+1)(x+5)}{(x-7)(x-2)}$

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

16. $\dfrac{2y-2}{y^2-4y}-\dfrac{y+8}{y^2-16}$ **16.** _____

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

c. $\dfrac{y+2}{y(y+4)}$ **d.** $\dfrac{y-10}{2(y-4)(y+2)}$

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

a. $\dfrac{58b-22a}{3a-7b}$ **b.** $\dfrac{18a-58b}{3a-7b}$ **c.** 6 **d.** $\dfrac{22a-58b}{3a-7b}$

18. $\dfrac{\dfrac{4}{a^2}-\dfrac{1}{4}}{\dfrac{2}{a}-\dfrac{1}{2}}$ **18.** _____

a. $\dfrac{3}{2a}$ **b.** $\dfrac{3}{a-2}$ **c.** $\dfrac{4+a}{2a}$ **d.** $\dfrac{4a}{a-2}$

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

a. $-\dfrac{125}{343}$ **b.** $\dfrac{343}{125}$ **c.** $\dfrac{125}{343}$ **d.** $-\dfrac{343}{125}$

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

Assume that all variables represent positive real numbers.

a. $\dfrac{x^{23/2}y^{1/2}}{z^{15/2}}$ **b.** $x^{23/20}y^{1/20}z^{37/4}$

c. $\dfrac{y^{9/2}}{x^{7/2}z^{15/2}}$ **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.** $9\sqrt{3x}$

23. $\left(\sqrt{10}+2\sqrt{5}\right)^2$ **23.** _____

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

c. $30+10\sqrt{2}$ **d.** 20

24. Rationalize the denominator of $\dfrac{15}{2\sqrt{7}-\sqrt{10}}$. **24.** _____

a. $\dfrac{5\left(2\sqrt{7}-\sqrt{10}\right)}{6}$ **b.** $\dfrac{15\left(2\sqrt{7}+\sqrt{10}\right)}{4}$

c. $\dfrac{5\left(2\sqrt{7}+\sqrt{10}\right)}{6}$ **d.** $\dfrac{15\left(2\sqrt{7}-\sqrt{10}\right)}{4}$

25. One of the two solutions of a quadratic equation, x, can be found by the formula **25.** _____

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

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. $\dfrac{7+\sqrt{71}}{10}$ **b.** $-\dfrac{4}{5}$ **c.** $\dfrac{7-\sqrt{71}}{10}$ **d.** 2

NAME_____
DATE_____

1. Let $B = \left\{\sqrt{10}, -1.\overline{55}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14}\right\}$.

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

A. Irrational numbers **1. A.** _____

a. $\sqrt{10}, -1.\overline{55}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14}$ **b.** $\sqrt{10}, -1.\overline{55}, -\pi, \sqrt{64}, 0$

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. $12, \frac{15}{5}, 0, -1.\overline{55}, \sqrt{64}$ **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.** $12, \frac{15}{5}, 0, -1.\overline{55}, \sqrt{64}, \frac{5}{14}$

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.** $\frac{1}{3}$