Self-assessment 0990 (Beginning Algebra)

If you can work these problems without using a calculator, you should have sufficient knowledge to demonstrate mastery of Beginning Algebra and to succeed in a subsequent course.

Use the properties of real numbers to simplify the expression.

1) $\frac{5}{6}(-0.15)\left(\frac{6}{5}\right)$

1) _____

Simplify.

2) $-\frac{1}{12}+16y+\frac{17}{12}y-19+\frac{7}{12}y$

2) _____

3) $-3.2p+5.7-(8p+.5)+5.7p$

3) _____

Solve.

4) $-\frac{2}{3}q+2q=\frac{6}{5}q+\frac{2}{5}$

4) _____

Solve the problem.

5) The sum of twice a number and 11 less than the number is the same as the difference between –39 and the number. What is the number?

5) _____

6) Find the measure of an angle, if its supplement measures 20° more than twice its complement.

6) _____

7) If the first and third of three consecutive odd integers are added, the result is 87 less than five times the second integer. Find the third integer.
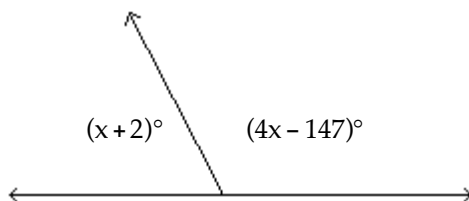
7) _____

Use a formula to solve the problem.

8) A rectangular Persian carpet has a perimeter of 180 inches. The length of the carpet is 18 inches more than the width. What are the dimensions of the carpet?

8) _____

Find the measure of each marked angle.

9)

9) _____

$(x+2)°$ $(4x-147)°$

Solve the formula for the specified variable.

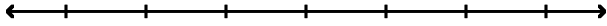10) $V = \frac{1}{3}Bh$ for h

10) _____

Solve the problem.

11) If a boat uses 20 gallons of gas to go 71 miles, how many miles can the boat travel on 80 gallons of gas?

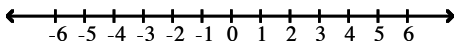11) _____

Solve the inequality, then graph the solution.

12) $-7x + 2 - 5x < 2 - 14x + 4$

12) _____

13) $-1 < -4a + 3 \le 15$

13) _____

Solve the problem.

14) A bank teller has some five-dollar bills and some twenty-dollar bills. The teller has 5 more of the twenties. The total value of the money is $650. Find the number of five-dollar bills that the teller has.
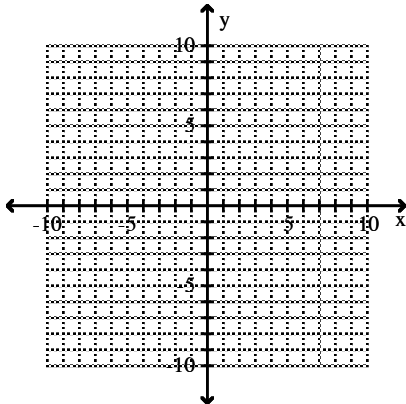
14) _____

15) Candy and Delvis are riding bicycles in the same direction. Candy is traveling at a speed of 7 miles per hour, and Delvis is traveling at a speed of 15 miles per hour. In 5 hours what is the distance between them (assuming that they began at the same point and time)?

15) _____

Graph the linear equation.

16) $x = -8$

16) _____

Find the slope of the line through the pair of points.

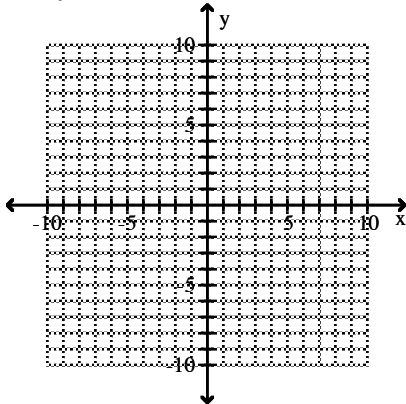17) (–2, –3) and (7, 2)

17) _____

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Solve the problem.

18) Using a phone card to make a long distance call costs a flat fee of $0.18 plus $0.25 per minute starting with the first minute. What is an equation of the form $y = mx + b$ for this situation?

18) _____

Graph.

19) $2x - y = -6$

19) _____

Write the equation in standard form of the line satisfying the given conditions.

20) Through (4, 3); $m = -\dfrac{6}{7}$

20) _____

Write an equation in slope–intercept form of the line satisfying the given conditions.
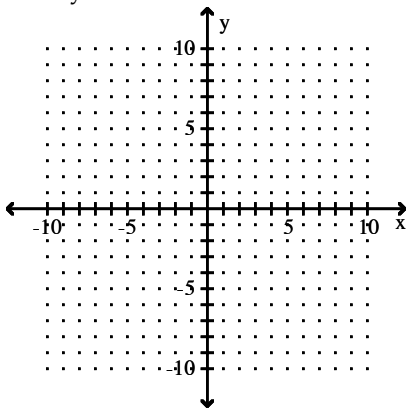
21) Through (–5, 13), perpendicular to $-2x - 7y = -39$

21) _____

Solve the system of equations by graphing. If the system is inconsistent or the equations are dependent, say so.

22) $3x + 2y = 13$
    $2x + 3y = 17$

22) _____

Solve the system of equations by the substitution method.

23) $x + y = -4$
    $x + y = 8$

23) _____

Solve the system of equations.

24) $\dfrac{3x}{2} - \dfrac{y}{3} = -18$

24) _____

$\dfrac{3x}{4} + \dfrac{2y}{9} = -9$

Solve the system by the elimination method.

25) $2x + 6y = 13$

25) _____

$4x + 12y = 26$

Solve the problem.

26) In a chemistry class, 3 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

26) _____

27) Helen Weller invested $10,000 in an account that pays 12% simple interest. How much additional money must be invested in an account that pays 15% simple interest so that the total interest is equal to the interest on the two investments at the rate of 13%?

27) _____

28) A cruise boat travels 60 miles downstream in 4 hours and returns upstream in 12 hours. Find the rate of the stream.

28) _____

Use a combination of rules for exponents to simplify. Write answers with only positive exponents. Assume that all variables represent nonzero real numbers.

29) $\left(\dfrac{tz^{-3}}{t^{-2}z}\right)^{-2}$

29) _____

Evaluate the expression.

30) $9^{-1} + 6^{-1}$

30) _____

Evaluate.

31) $-(14)^0 + (-7)^0$

31) _____

Provide an appropriate response.

32) In a state with a population of 8,000,000 people, the average citizen spends $6,000 on housing each year. What is the total spent on housing for the state? Write your answer in scientific notation.

32) _____

Perform the indicated operation. Write the answer in scientific notation (rond to the tenths place).

33) $\dfrac{5.9 \times 10^{-7} \times 5.4 \times 10^{-6}}{4 \times 10^4 \times 3.9 \times 10^6}$

33) _____

Simplify

34) $(13x + 6xy - 8y) - (25x - 20xy - 17y)$

34) _____

Find the product.

35) $-5x^6(-5x^6 - 8x^3 + 9)$ 35) _____

36) $x^2(x-4)^3$ 36) _____

Perform the division.

37) $\dfrac{x^4 + 3x^2 + 5}{x^2 + 1}$ 37) _____

Factor completely.

38) $40r^2 + 45ry - 8xr - 9xy$ 38) _____

Factor completely.

39) $3x^3 + 3x^2y - 18xy^2$ 39) _____

40) $20x^2 - 17x - 24$ 40) _____

Factor the polynomial completely.

41) $27a^3 - 8b^3$ 41) _____

42) $32x^4 - 2$ 42) _____

Solve the equation.

43) $8b^2 + 26b + 4 = -11$ 43) _____

Solve the problem.

44) A parallelogram has a base of length $2x+1$ and a height of $x+3$ and has an area of 42 square units. Find the base and height of the parallelogram.   44) _____

Solve the equation.

45) $3x(x+4) = (2x-9)(x+4)$ 45) _____

Solve the problem.

46) The height of a box is 3 inches. The length is three inches more than the width. Find the width if the volume is 210 cubic inches.   46) _____

47) The hypotenuse of a right triangle is 1 cm longer than the longer leg. The shorter leg is 7 cm shorter than the longer leg. Find the lenth of the longer leg of the triangle.   47) _____

1) –0.15

2) $18y - \dfrac{229}{12}$

3) –5.5p +5.2

4) {3}

5) –7

6) 20°

7) 31
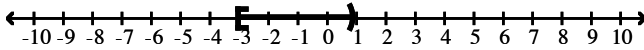
8) 36 in. by 54 in.

9) 67° and 113°

10) $h = \dfrac{3V}{B}$

11) 284 miles

12) (–∞, 2)
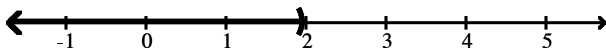
13) [–3, 1)

14) 22

15) 40 miles

16)
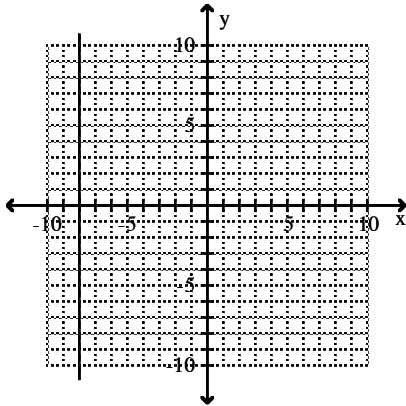
17) $\dfrac{5}{9}$

18) $y = 0.25x + 0.18$

19)
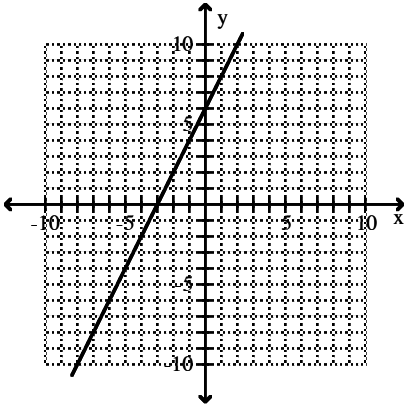
20) $6x + 7y = 45$

21) $y = \frac{7}{2}x + \frac{61}{2}$

22) $\{(1, 5)\}$

23) $\varnothing$

24) $\{(-12, 0)\}$

25) $\{(x, y) \mid 2x + 6y = 13\}$

26) 1.5 L

27) $5000

28) 5 mph

29) $\dfrac{z^8}{t^6}$

30) $\dfrac{5}{18}$

31) 0

32) 4.8×10^{10}

33) 2.0×10^{-23}

34) $-12x + 26xy + 9y$

35) $25x^{12} + 40x^9 - 45x^6$

36) $x^5 - 12x^4 + 48x^3 - 64x^2$

37) $x^2 + 2 + \dfrac{3}{x^2 + 1}$

38) $(8r + 9y)(5r - x)$

39) $3x(x - 2y)(x + 3y)$

40) $(5x - 8)(4x + 3)$

41) $(3a - 2b)(9a^2 + 6ab + 4b^2)$

42) $2(4x^2 + 1)(2x - 1)(2x + 1)$

43) $\left\{ -\dfrac{3}{4}, -\dfrac{5}{2} \right\}$

44) height = 6 units; base = 7 units

45) $\{-4, -9\}$

46) 7 in.

47) 12 cm