# Math 0990 - Beginning Algebra - Practice Problems for the Final Exam

Perform the division.

1) $(p^2 + 4p - 42) \div (p + 9)$ 1) _____

A) $p - 3 + \frac{5}{p + 9}$ B) $p - 5 + \frac{3}{p + 9}$ C) $p + 5 + \frac{3}{p + 9}$ D) $p - 5$

Solve the problem.

2) Jill is 9 km away from Joe. Both begin to walk toward each other at the same time. Jill walks at 2.5 km per hour. If they meet in 2 hours, how fast is Joe walking? 2) _____

A) 2 km per hour B) 3 km per hour

C) 2.5 km per hour D) 4 km per hour

Solve the equation.

3) $4k^2 - 64 = 0$ 3) _____

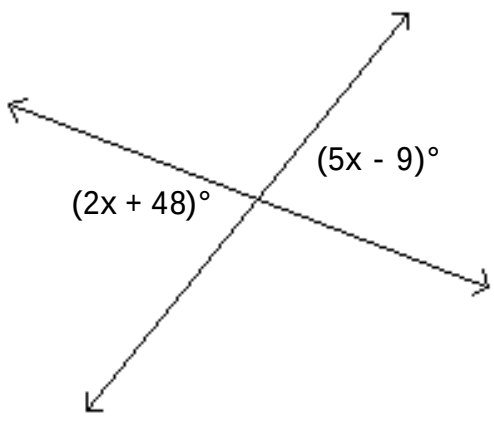
A) $\left\{\frac{1}{4}, -\frac{1}{4}\right\}$ B) $\{4, -4\}$ C) $\left\{\frac{1}{4}, 0\right\}$ D) {8, 0}

Solve the problem.

4) Thompson's Hardware spent $75,910 this year on advertising alone. If total sales were $ 886,600, what percent of total sales was spent on advertising? Round to the nearest tenth of a percent, if necessary. 4) _____

A) 11.7% B) 117% C) 0.9% D) 8.6%

5) Find the measure of each marked angle. 5) _____




A) 86° and 4° B) 83° and 83° C) 86° and 94° D) 86° and 86°

Perform the division.

6) $\frac{y^2 + 18y + 81}{y + 9}$ 6) _____

A) $y + \frac{9}{y + 9}$ B) $y + 9$ C) $y^2 + 9$ D) $y - 9$

Solve the problem.

7) Find the measure of an angle, if its supplement measures 21° more than twice its complement. 7) _____

A) 69° B) 31° C) 21° D) 42°

Solve the equation.

8) $10p + 4 = -3 + 7p + 1p$ 8) _____

A) $\left\{-\frac{2}{7}\right\}$ B) $\left\{-\frac{7}{2}\right\}$ C) $\left\{\frac{2}{7}\right\}$ D) $\left\{\frac{17}{2}\right\}$

Solve the problem.

9) How many liters of a 40% alcohol solution must be mixed with 20 liters of a 90% solution to get a 60% solution? 9) _____

A) 30 L B) 50 L C) 3 L D) 5 L

10) The formula for the perimeter of a rectangle is $P = 2L + 2W$. Solve for L. 10) _____

A) $L = P - W$ B) $L = \frac{P - 2W}{2}$ C) $L = \frac{P - W}{2}$ D) $L = d - 2W$

11) In the previous baseball season, team A won the most games of any major league team. Team A won 134 less than three times as many games as they lost. They played 162 regular-season games. How many wins and losses did team A have? 11) _____

A) Wins: 88; losses: 75 B) Wins: 89; losses: 73

C) Wins: 86; losses: 76 D) Wins: 88; losses: 74

Solve the equation.

12) $6 - (x - 2) = -6x + 5(x + 10)$ 12) _____

A) B) $\{21\}$

C) {all real numbers} D) $\varnothing$

Solve the problem.

13) An investment broker invests $109,800 in real estate and earns 2% per year on the investment. How much money is earned per year? 13) _____

A) $549,000 B) $21,960 C) $2196 D) $5,490,000

Solve the equation.

14) $6 - (x - 2) = -6x + 5(x + 10)$ 14) _____

A) $\left\{\frac{42}{0}v\right\}$ B) $\{21\}$

C) {all real numbers} D) $\varnothing$

Solve the problem.

15) From a point on a straight road, two cars are driven in opposite directions, one at 48 miles per hour and the other at 58 miles per hour. In how many hours will they be 424 miles apart? 15) _____

A) 4 hours B) 3 hours

C) Not enough information D) 5 hours

Simplify. Write the answer using only positive exponents. Assume all variables represent nonzero numbers.

16) $\frac{(x^{-3})^{-7}(x^{-1}y)^2}{(xy^{-7})^2}$ 16) _____

A) $x^{21}y^{16}$ B) $x^{20}y^5$ C) $x^{42}y^{-12}$ D) $x^{17}y^{16}$

Solve the equation.

17) $7(x + 2) = (7x + 14)$ 17) _____

A) {∅} B) {all real numbers}

C) {28] D) {0}

18) $x^2 - x = 6$ 18) _____

A) {-2, 3} B) {2, 3} C) {-2, -3} D) {1, 6}

Find the slope of the line.

19) A line parallel to the graph of $y - 2 = 5$ 19) _____

A) 2 B) 5 C) 0 D) Undefined

Solve the equation.

20) $\frac{x}{16} - \frac{3}{8} = \frac{x - 8}{8}$ 20) _____

A) {10 } B) {2 } C) {5 } D) {13 }

21) $\frac{4x - 2}{5} = \frac{6x + 5}{10}$ 21) _____

A) $\frac{1}{14}$ B) $\frac{9}{2}$ C) $\frac{1}{2}$ D) $\frac{9}{14}$

Solve the equation by factoring.

22) $3r^2 - 5r - 2 = 0$ 22) _____

A) $\left\{\frac{1}{5}, -\frac{1}{3}\right\}$ B) {-3, 2} C) $\left\{-\frac{1}{3}, 3\right\}$ D) $\left\{-\frac{1}{3}, 2\right\}$

Solve the equation.

23) $0.1(x + 60) + 0.4(x - 10) = 27$ 23) _____

A) {60} B) {50} C) {40} D) {100}

Simplify the complex fraction.

24) $\dfrac{\frac{x^8}{8y^5}}{\frac{x^6}{y^3}}$ 24) _____

A) $\frac{x^2}{8y^2}$ B) $\frac{x^2}{8y^8}$ C) $\frac{x^2}{y^2}$ D) $\frac{x^{14}}{8y^8}$

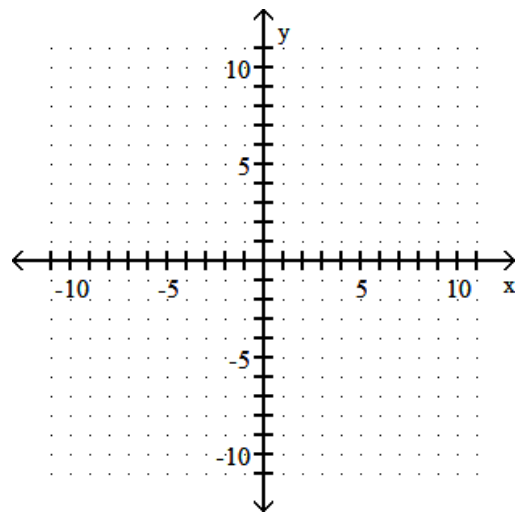
Find the slope of the line.

25) Through (-9, 3) and (6, 8) 25) _____

A) 3 B) 6 C) $\frac{1}{3}$ D) $\frac{1}{6}$

Graph the linear equation. Give the x- and y-intercepts.

26) $3x + y = -3$ 26) _____




Solve the equation.

27) $-\frac{6}{7}x = -12$ 27) _____

A) {14} B) $\left\{\frac{90}{7}\right\}$ C) $\left\{\frac{78}{7}\right\}$ D) $\left\{\frac{72}{7}\right\}$

Find the slope of the line.

28) $x - 6 = 0$ 28) _____

A) 1 B) 6 C) 0 D) Undefined

Find an equation of the line, and write it in (a) slope-intercept form if possible and (b) standard form.

29) Through $(-6, 2)$; horizontal 29) _____

A) (a) not possible
(b) $x = -6$

B) (a) $y = 2$
(b) $y = 2$

C) (a) not possible
(b) $x = -2$

D) (a) $y = 6$
(b) $y = 6$

Add.

30) $\frac{2}{9} + \frac{1}{5} + \frac{1}{15}$ 30) _____

A) $\frac{38}{135}$ B) $\frac{98}{225}$ C) $\frac{4}{29}$ D) $\frac{22}{45}$

Use a calculator to approximate the root to the nearest thousandth.

31) $\sqrt{163}$ 31) _____

A) 12.767 B) 12.754 C) 12.782 D) 12

Use a formula to solve the problem.

32) A square plywood platform has a perimeter which is 6 times the length of a side, decreased by 14. Find the length of a side. 32) _____

A) 1 B) 7 C) 2 D) 9

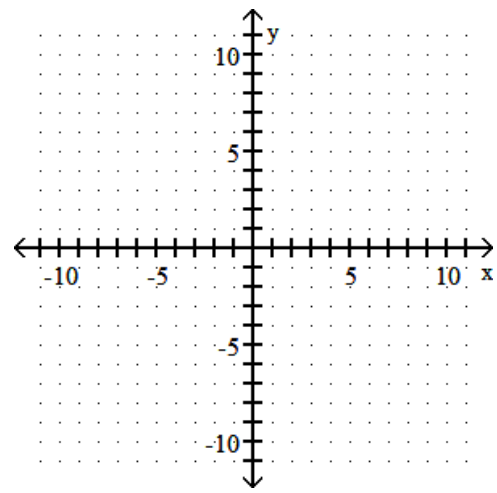
Simplify the complex fraction.

33) $\dfrac{\dfrac{5}{3r - 1} - 5}{\dfrac{5}{3r - 1} + 5}$ 33) _____

A) $\dfrac{2 + 3r}{3r}$ B) $\dfrac{2 - r}{r}$ C) $\dfrac{3r}{2 - 3r}$ D) $\dfrac{2 - 3r}{3r}$

Graph the linear equation. Give the x- and y-intercepts.

34) $x + 1 = 0$ 34) _____




Factor completely. If the polynomial is prime, say so.

35) $16y^4 - 56y^3 - 32y^2$ 35) _____

A) $8y^2(2y + 1)(y - 4)$ B) $y^2(16y - 8)(y + 4)$

C) $8y^2(2y - 1)(y + 4)$ D) Prime

Evaluate.

36) $\sqrt[3]{-216}$ 36) _____

A) -36 B) 6i C) -6 D) 6

Factor completely. If the polynomial is prime, say so.

37) $x^2 + 64$ 37) _____

A) $(x + 8)^2$ B) $(x + 8)(x - 8)$ C) $(x - 8)^2$ D) Prime

38) $x^2 + 4$ 38) _____

A) $(x + 2)^2$ B) $(x + 2)(x - 2)$ C) $(x - 2)^2$ D) Prime

Find the slope of the line.

39) $y = 8$ 39) _____

A) 0 B) Undefined C) -8 D) 8

Factor completely. If the polynomial is prime, say so.

40) $x^2 + 35x + 36$ 40) _____

A) $(x + 36)(x - 1)$ B) Prime C) $(x - 12)(x + 3)$ D) $(x + 12)(x - 3)$

Simplify the expression.

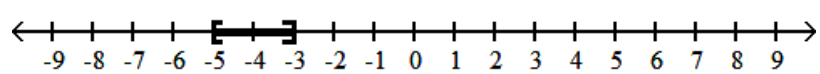
41) $\frac{6\sqrt{30}}{2\sqrt{5}}$ 41) _____

A) $3\sqrt{6}$ B) $2\sqrt{6}$ C) 18 D) $3\sqrt{5}$

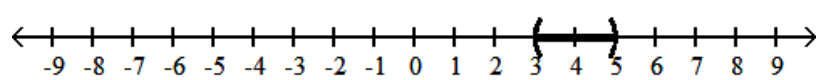
Solve the inequality and graph the solution set.

42) $4 < 3t - 5 \leq 10$ 42) _____

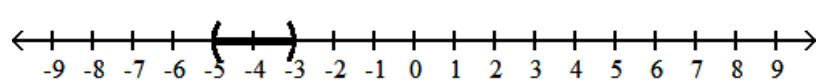
A) [-5, -3]



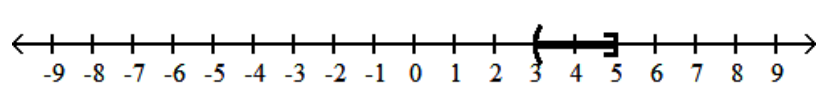

B) (3, 5)




C) (-5, -3)




D) (3, 5]




Factor completely. If the polynomial is prime, say so.

43) $x^4 - 1$ 43) _____

A) $(x^2 - 1)(x + 1)(x - 1)$ B) $(x + 1)^2(x - 1)^2$

C) $(x^2 + 1)(x + 1)(x - 1)$ D) Prime

Evaluate the expression using the given values.

44) $9x - 2y^2$; $x = 3, y = -4$. 44) _____

A) 59 B) 19 C) -5 D) 11

Find the product.

45) $(3y - 4)(9y^2 + 12y + 16)$ 45) _____

A) $27y^3 - 64$ B) $27y^3 + 48y^2 - 64$

C) $9y^3 + 64$ D) $27y^3 + 64$

Express the radical in simplified form. Assume that all variables represent positive real numbers.

46) $-\sqrt[3]{125x^4y^5}$ 46) _____

A) $-5xy\sqrt[3]{xy^2}$ B) $5xy\sqrt[3]{xy^2}$ C) $-5xy\sqrt[3]{xy}$ D) $xy\sqrt[3]{xy^2}$

Solve the problem. Round your answer to the nearest tenth, when appropriate.

47) A rock falls from a tower that is 49 m high. As it is falling, its height is given by the formula $h = 49 - 4.9t^2$. How many seconds will it take for the rock to hit the ground (h=0)? 47) _____

A) 490 sec B) 3.2 sec C) 6.6 sec D) 7 sec

Simplify. Assume that x and y are nonzero.

48) $\dfrac{(5x^2y)^4(xy^4)^4}{(xy)^3}$ 48) _____

A) $5x^9y^{17}$ B) $5x^{12}y^{20}$ C) $625x^9y^{17}$ D) $625x^5y^{17}$

Solve the equation.

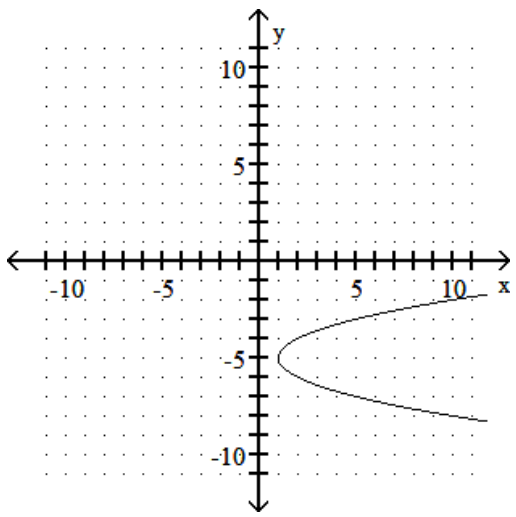
49) $x^2 + 18x + 81 = 0$ 49) _____

A) {9, 1} B) {-9} C) {-9, 0} D) {9}

Solve.

50) How do you find the x-intercept of the graph of a linear equation in two variables? How do you find the y-intercept? 50) _____

51) Use the vertical line test to determine whether the graph is that of a function. 51) _____




A) Function B) Not a function

Find any values of the variable for which the rational expression is undefined. Write answer with ≠.

52) $\dfrac{-7q - 3}{q^2 + 25}$ 52) _____

A) $q \neq -5$ B) $q \neq 5, q \neq -5$

C) $q \neq 0$ D) Never undefined

Multiply or divide. Write the answer in lowest terms.

53) $\dfrac{3(p - 1)}{p} \div \dfrac{8(p - 1)}{4p^2}$ 53) _____

A) $\dfrac{3p}{2}$ B) $\dfrac{12p^3 - 12p^2}{8p^2 - 8p}$

C) $\dfrac{2}{3p}$ D) $\dfrac{24p^2 + 48p + 24}{4p^3}$

For the polynomial function, find the requested value.

54) f(x) = 8x + 7; f(4) 54) _____

A) 25 B) 64 C) 15 D) 39

Evaluate.

55) $-\sqrt{196}$ 55) _____

A) -98 B) Not a real number

C) 14 D) -14

56) $\sqrt[3]{-343}$ 56) _____

A) 7 B) -49 C) 49 D) -7

Add or subtract. Write the answer in lowest terms.

57) $\frac{4x}{x+6} + \frac{3}{x-6}$ 57) _____

A) $\frac{4x+3}{(x+6)(x-6)}$ B) $\frac{4x^2-21x+18}{x^2+12x+36}$ C) $\frac{4x^2-21x+18}{x^2-36}$ D) $\frac{4x^2-21x+18}{x^2-12x+36}$

58) $\frac{9}{7-y} - \frac{2}{y-7}$ 58) _____

A) $\frac{7}{7-y}$ B) $\frac{11}{7-y}$ C) $\frac{18}{7-y}$ D) $\frac{-7}{7-y}$

Perform the indicated operation.

59) $-3\frac{4}{5} + 6\frac{3}{7}$ 59) _____

A) $\frac{2}{5}$ B) $2\frac{22}{35}$ C) $-\frac{16}{35}$ D) $-2\frac{22}{35}$

60) $(7x - 11y)^2$ 60) _____

A) $49x^2 - 154xy + 121y^2$ B) $7x^2 + 121y^2$

C) $49x^2 + 121y^2$ D) $7x^2 - 154xy + 121y^2$

Multiply or divide. Write the answer in lowest terms.

61) $\frac{2t^2-5t-12}{3t^2+2t-1} \cdot \frac{3t^2+17t-6}{t^2+2t-24}$ 61) _____

A) $\frac{2t+3}{t-1}$ B) $\frac{(2t+3)(t+4)}{(t+6)(3t-1)}$ C) $\frac{2t+3}{t+1}$ D) $\frac{(2t+3)(t+6)}{(t+1)(t-6)}$

Simplify the expression.

62) $(3p^4s^4)^4(s^3)$ 62) _____

A) $81p^{16}s^{19}$ B) $3p^{16}s^{19}$ C) $81p^8s^{11}$ D) $81p^8s^{48}$

Find an equation of the line satisfying the conditions. Write the equation in slope-intercept form.

63) Through (-3, 8); perpendicular to $-3x + 4y = -23$ 63) _____

A) $y = -\frac{3}{4}x + \frac{23}{4}$ B) $y = \frac{4}{3}x + 12$ C) $y = -\frac{4}{3}x + 4$ D) $y = \frac{3}{4}x + \frac{41}{4}$

Find any values of the variable for which the rational expression is undefined. Write answer with ≠.

64) $\frac{x^2 - 25}{x^2 + 11x + 24}$ 64) _____

A) $x \neq 0$ B) $x \neq 3, x \neq -8$ C) $x \neq -3, x \neq -8$ D) $x \neq 5, x \neq -5$

Write the number without exponents.

65) $7.3884 \times 10^7$ 65) _____

A) 738,840,000 B) 73,884,000 C) 517.188 D) 7,388,400

Find any values of the variable for which the rational expression is undefined. Write answer with ≠.

66) $\frac{2}{a + 8}$ 66) _____

A) $a \neq 8$ B) $a \neq -8$

C) $a \neq 0$ D) Never undefined

Find any values of the variable for which the rational expression is undefined. Write answer with ≠.

67) $\frac{x^2 - 4}{x^2 - 11x + 30}$ 67) _____

A) $x \neq 0$ B) $x \neq 2, x \neq -2$ C) $x \neq -5, x \neq -6$ D) $x \neq 5, x \neq 6$

Write the number in scientific notation.

68) The earth is approximately 92,900,000 miles from the sun. 68) _____

A) $9.29 \times 10^7$ B) $9.29 \times 10^8$ C) $9.29 \times 10^6$ D) $9.29 \times 10^{-7}$

Multiply or divide as indicated. Write the answer in lowest terms.

69) $\frac{z^2 + 15z + 54}{z^2 + 17z + 72} \div \frac{z^2 + 6z}{z^2 + 18z + 80}$ 69) _____

A) $\frac{z + 10}{z^2 + 8z}$ B) $z + 10$ C) $\frac{z + 10}{z}$ D) $\frac{z}{z^2 + 17z + 72}$

Write the number without exponents.

70) $6.279 \times 10^{-5}$ 70) _____

A) 0.000006279 B) 0.00006279 C) 0.0006279 D) -627,900

Simplify by combining like terms.

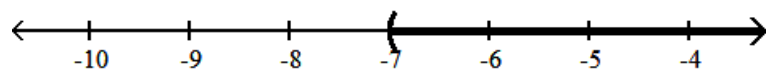
71) $2(2x - 1) - (x - 5) + 5(4x + 10)$ 71) _____

A) $23x + 53$ B) $23x + 43$ C) $24x + 53$ D) $25x + 43$

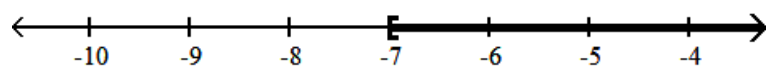
Solve the inequality. Write the solution set in interval notation and graph it.

72) $12x - 18 > 3(3x - 13)$ 72) _____

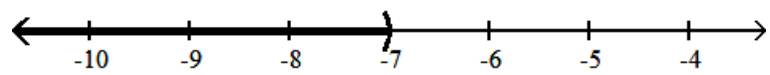
A) $(-7, \infty)$



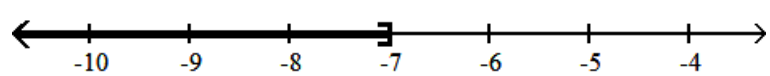

B) $[-7, \infty)$




C) $(-\infty, -7)$




D) $(-\infty, -7]$




Factor the polynomial completely.

73) $t^3 + 512$ 73) _____

A) $(t - 8)(t^2 + 8t + 64)$

B) $(t - 512)(t^2 - 1)$

C) $(t + 8)(t^2 + 64)$

D) $(t + 8)(t^2 - 8t + 64)$

Multiply or divide as indicated. Write the answer in lowest terms.

74) $\dfrac{2t^2 - 3t - 9}{3t^2 - 4t - 7} \cdot \dfrac{3t^2 + 11t - 42}{t^2 + 3t - 18}$ 74) _____

A) $\dfrac{(2t + 3)(t + 3)}{(t + 6)(3t - 7)}$

B) $\dfrac{2t + 3}{t - 1}$

C) $\dfrac{2t + 3}{t + 1}$

D) $\dfrac{(2t + 3)(t + 6)}{(t + 1)(t - 6)}$

Solve the equation for the indicated variable.

75) $aS^2 + bS = c$, for S 75) _____

A) $S = \dfrac{-b + \sqrt{b^2 - 4ac}}{2a}$

B) $S = \dfrac{-b + b^2 + 4ac}{2a}$

C) $S = \dfrac{-b + \sqrt{b^2 + 4ac}}{2a}$

D) $S = \dfrac{-b + b^2 - 4ac}{2a}$

Factor the polynomial completely.

76) $8a^3 - 27b^3$ 76) _____

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

B) $(2a - 3b)(4a^2 + 9b^2)$

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

D) $(8a - 3b)(a^2 + 6ab + 9b^2)$

Factor completely.

77) $18x^2 - 78x - 60$ 77) _____

A) Prime

B) $6(3x + 2)(x - 5)$

C) $(18x + 12)(x - 5)$

D) $6(3x - 2)(x + 5)$

Subtract.

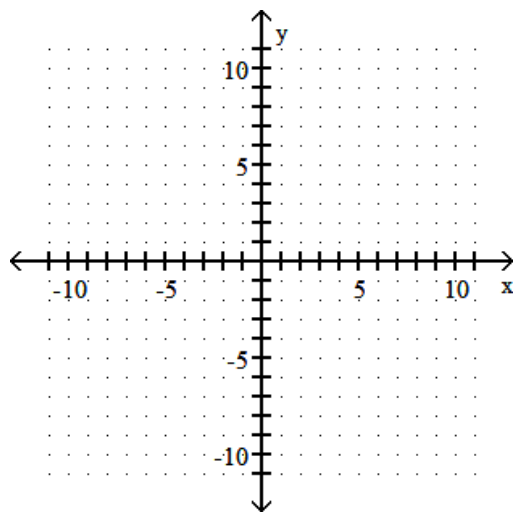
78) $(5x^5 + 6x^7 - 9 - 8x^6) - (1 - 4x^6 + 3x^7 - 2x^5)$ 78) _____

A) $9x^7 - 12x^6 + 3x^5 - 10$ B) $3x^7 - 4x^6 + 7x^5 - 10$

C) $3x^7 - 12x^6 + 3x^5 - 8$ D) $9x^7 - 12x^6 + 3x^5 - 8$

Solve the system by graphing.

79) $5x + y = -28$ 79) _____
$x + 2y = -11$




Decide whether or not the ordered pair is a solution to the equation.

80) $4x - 3y = 25$; (4, 3) 80) _____

A) Yes B) No

Write an equation for the line. Give the final answer in slope-intercept form.

81) Through (1, -5) and (-3, -8) 81) _____

A) $y = -\frac{6}{5}x - \frac{22}{5}$ B) $y = \frac{3}{4}x - \frac{23}{4}$ C) $y = -\frac{3}{4}x - \frac{23}{4}$ D) $y = \frac{6}{5}x - \frac{22}{5}$

Factor by grouping.

82) $35 - 5s - 7p + sp$ 82) _____

A) $(7 + s)(5 - p)$ B) $(7 + s)(5 + p)$ C) $(7 - s)(5 + p)$ D) $(7 - s)(5 - p)$

Write the quotient without using exponents.

83) $\frac{6 \times 10^{-3}}{2 \times 10^4}$ 83) _____

A) 60 B) 0.0000006 C) 30 D) 0.0000003

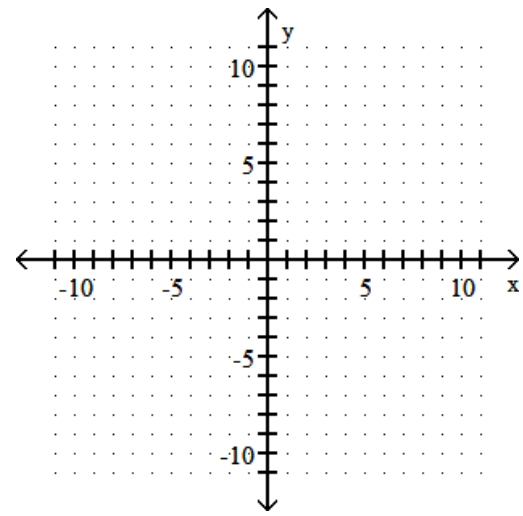
Write the rational expression in lowest terms.

84) $\frac{y^2 + 2y - 15}{y^2 - 4y - 45}$ 84) _____

A) $-\frac{y^2 + 2y - 15}{y^2 - 4y - 45}$ B) $\frac{2y - 15}{-4y - 45}$ C) $\frac{2y - 1}{-4y - 3}$ D) $\frac{y - 3}{y - 9}$

Graph the linear inequality.

85) $8x + 5y > -2$ 85) _____




Factor completely. If the polynomial cannot be factored, write prime.

86) $x^2 - 4x - 32$ 86) _____

A) $(x + 4)(x - 8)$ B) $(x - 4)(x + 1)$ C) $(x - 4)(x + 8)$ D) Prime

Evaluate the expression.

87) $13^0 + (-5)^0$ 87) _____

A) 1 B) 2 C) 8 D) 0

Solve the problem.

88) Mardi received an inheritance of $70,000. She invested part at 12% and deposited the remainder in tax-free bonds at 8%. Her total annual income from the investments was $8000. Find the amount invested at 12%. 88) _____

A) $30,000 B) $62,000 C) $60,000 D) $59,000

Evaluate the expression.

89) $5^{-1} + 2^{-1}$ 89) _____

A) $\frac{10}{7}$ B) $\frac{1}{3}$ C) $\frac{7}{10}$ D) 2

Solve the problem.

90) Sarah has grades of 99 and 69 on his first two tests. If she wants an average of at least 80 after her third test, what score must she make on that test? 90) _____

A) 72 or more B) 80 or more C) 84 or more D) 83 or more

Find an equation of the line passing through the two points. Write the equation in standard form.

91) (1, -2) and (-2, 9) 91) _____

A) $3x - 11y = -93$ B) $11x + 3y = 5$

C) $-11x + 3y = 5$ D) $-3x + 11y = -93$

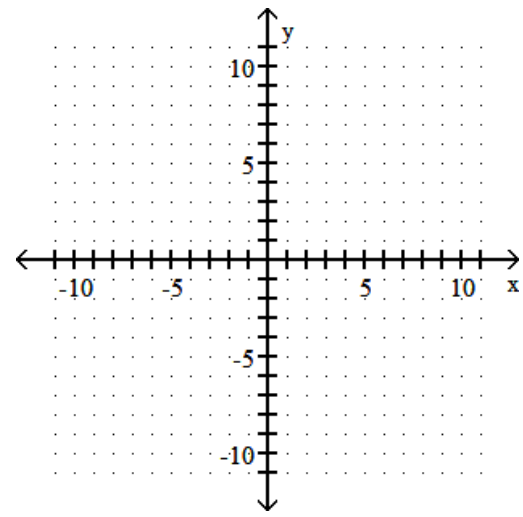
Write the number in scientific notation.

92) 0.000029213 92) _____

A) $2.9213 \times 10^5$ B) $2.9213 \times 10^{-4}$ C) $2.9213 \times 10^{-5}$ D) $2.9213 \times 10^4$

Graph the linear inequality in two variables.

93) $x + y \le 6$ 93) _____




Perform the division.

94) $\dfrac{48x^7 + 30x^6 + 12x^4 + 24x^2}{6x^4}$ 94) _____

A) $8x^3 + 5x^2 + 2 + \dfrac{4}{x^2}$

B) $8x^3 + 9x^2 + 2$

C) $8x^3 + 5x^2 + 2$

D) $-8x^3 - 5x^2 - 2 - \dfrac{4}{x^2}$

Factor the polynomial completely.

95) $t^3 + 27$ 95) _____

A) $(t + 3)(t^2 + 9)$

B) $(t + 3)(t^2 - 3t + 9)$

C) $(t - 3)(t^2 + 3t + 9)$

D) $(t - 27)(t^2 - 1)$

Add or subtract. Write the answer in lowest terms.

96) $\dfrac{x}{x^2 - 16} - \dfrac{8}{x^2 + 5x + 4}$ 96) _____

A) $\dfrac{x^2 + 7x + 32}{(x - 4)(x + 4)(x + 1)}$

B) $\dfrac{x^2 - 7x + 32}{(x - 4)(x + 4)}$

C) $\dfrac{x^2 - 7}{(x - 4)(x + 4)(x +1)}$

D) $\dfrac{x^2 - 7x + 32}{(x - 4)(x + 4)(x + 1)}$

Perform the indicated operation.

97) $9^2 + 8 \cdot 12 - (10 + 5 \cdot 2)$ 97) _____

A) 177 B) 147 C) 1048 D) 157

Solve the problem.

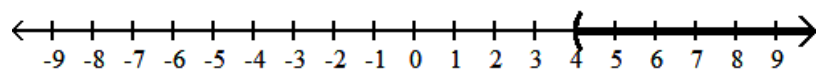
98) A woman has \$1.70 in dimes and nickels. She has 2 more dimes than nickels. How many nickels does she have? 98) _____

A) 12 nickels B) 8 nickels C) 14 nickels D) 10 nickels

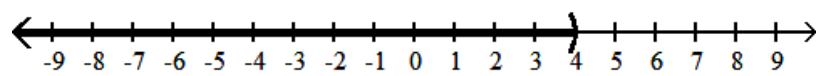
Solve the inequality and graph the solution set.

99) $-10x + 5(x - 6) \geq 7x - (2 + 2x) - 68$ 99) _____

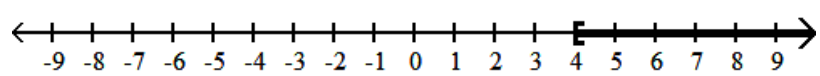
A) $(4, \infty)$



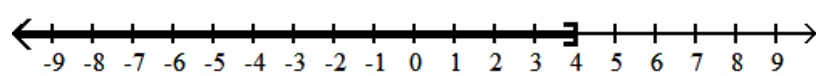

B) $(-\infty, 4)$




C) $[4, \infty)$




D) $(-\infty, 4]$




Solve the problem.

100) A ladder is resting against a wall. The top of the ladder touches the wall at a height of 15 ft. Find the length of the ladder if the length is 5 ft more than its distance from the wall. 100) _____

A) 15 ft B) 25 ft C) 30 ft D) 20 ft