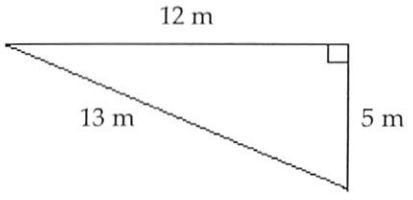
MAT0028 Final Exam Review

Write the described ratio in fractional notation in lowest terms.

1) Find the ratio of the longest side to the perimeter of the right triangle.



2) According to an organization's membership list, it has 450 members who are married and 1050 members who are single. What is the ratio of members who are married to members who are single?

Solve the proportion.

3) $\frac{x+1}{2x+4} = \frac{7}{2}$

Solve. If necessary, round percents to the nearest tenth, dollar amounts to the nearest cent, and all other numbers to the nearest whole.

4) A union contract calls for a 3.5% salary increase for all employees. Determine the increase for a worker who is currently making $30,490.

Solve.

5) A watch has a purchase price of $48. If the sales tax on this purchase is $4.08, find the sales tax rate.

6) A salesperson earned a commission of $2665 for selling $53,300 worth of batteries to various stores. Find the commission rate.

7) A $320 fax machine is on sale at 20% off. Find the discount.

8) A $320 watch is on sale at 30% off. Find the sale price.

9) Annie borrows $3300 and agrees to pay it back in 3 years. If the simple interest rate is 12%, find the total amount she pays back.

Solve the equation.

10) $6x - (5x - 1) = 2$

11) $(y - 9) - (y + 3) = 3y$

12) $-5x + 2(-3x - 2) = -6 - 9x$

13) $-2x + 5(-2x - 5) = -28 - 9x$

14) $\frac{a}{4} - \frac{1}{4} = -6$

Solve.

15) The house numbers of two adjacent homes are two consecutive even numbers. If their sum is 426, find the house numbers.

16) You have taken up gardening for relaxation and have decided to fence in your new rectangular shaped masterpiece. The length of the garden is 4 meters and 36 meters of fencing is required to completely enclose it. What is the width of the garden?

17) Use the formula $F = \frac{9}{5}C + 32$ to write 45° C as degrees Fahrenheit.

Solve the equation for the indicated variable.

18) $A = \frac{1}{2}bh$ for h

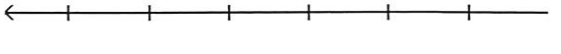
19) $P = 2L + 2W$ for L

20) $P = 2L + 2W$ for W

Solve the inequality and graph.

21) $15x + 25 > 5(2x - 2)$

22) $42x + 24 > 6(6x + 13)$



Evaluate the expression with the given replacement values.

23) $\frac{5}{7x^2}$ when $x = -7$

Use the product rule to simplify. Write the results using exponents.

24) $(-4p^8)(-3p^5)$

Use the power rule and the power of a product or quotient rule to simplify the expression.

25) $(-4xy)^3$

Simplify the expression.

26) $(-5x^6yz^6)^2$

27) $\left(\frac{20t^3}{10s^4}\right)^3$

Simplify the expression. Write the result using positive exponents only.

28) -2^{-3}

29) $(z^9x^9)^{-4}$

30) $(2x^2)^3x^{-15}$

31) $\left(\frac{xy^4}{x^3y}\right)^{-2}$

Write the number in scientific notation.

32) 0.000415

Write the number in standard notation.

33) 9.77×10^{-4}

Perform the indicated operations.

34) $(8x^8 + 8x^7 + 5x^6 + 2) + (7x^8 + 5x^7 + 8x^6 - 6)$

Add or subtract as indicated.

35) $(20x^2y^2 + 4y^4) - (-5x^4 - 10x^2y^2 + 4y^4)$

Multiply.

36) $-4x^5(8x - 9)$

Find the product.

37) $(6x + 1)^2$

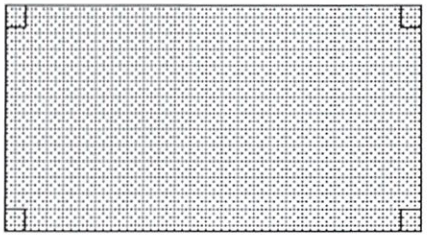
38) $(y - 3)(y^2 + 3y - 5)$

Multiply.

39) $(9y + x)(9y - x)$

Find the area of the shaded region. Write the answer as a polynomial in descending powers of x.

40)



$(7x - 10)$ inches

$(2x + 10)$ inches

Perform the division.

41) $\frac{-30x^6 - 36x^5 - 18x^4}{-6x^5}$

Factor out the GCF from the polynomial.

42) $18y^3 - 4y^2 + 10y$

Factor a -1 from the polynomial.

43) $-x - 11$

Factor the four-term polynomial by grouping.

44) $3xy + 12x + 7y + 28$

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

45) $x^2 + x - 6$

46) $a^2 - 2ab - 8b^2$

Factor the trinomial completely.

47) $8x^2 - x - 69$

48) $20y^2 - 23y + 6$

49) $x^2 + 16x + 64$

Factor the binomial completely.

50) $49x^2 - 16$

Solve the equation.

51) $5x^2 - 35x + 60 = 0$

52) $9x^2 = 25$

Find the value of the expression for the given replacement value.

53) $\frac{a^2}{1 - a^2}$; $a = -5$

Find any numbers for which the rational expression is undefined.

54) $\frac{6}{a + 7}$

Simplify the expression.

55) $\frac{y^2 + 9y + 18}{y^2 + 11y + 24}$

Find the product and simplify.

56) $\frac{3x^2}{4} \cdot \frac{8}{x^3}$

Find the quotient and simplify.

57) $\frac{x - 5}{9 - x} \div \frac{x^2 + 11x + 30}{x^2 - 4x - 45}$

Convert as indicated.

58) 14 square feet = _____ square inches

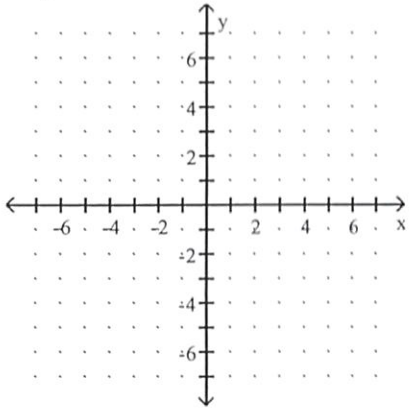
Perform the indicated operation. Simplify if possible.

59) $\frac{7}{8x} + \frac{8}{9x}$

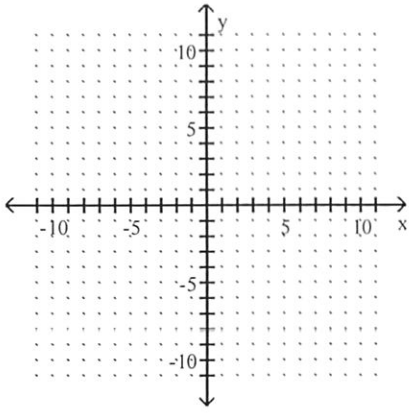
60) $\frac{5}{6x} + \frac{4}{5x}$

Graph the linear equation.

61) $x - y = -6$

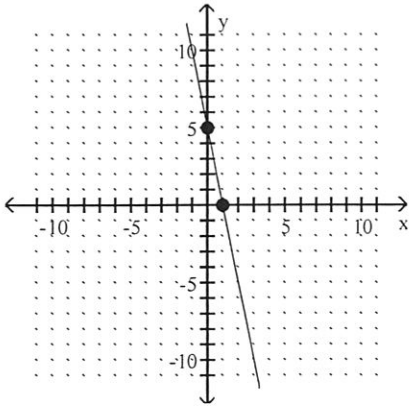


62) $x = -8$



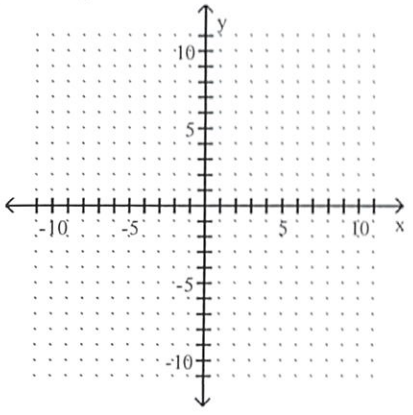
Identify the intercepts.

63)



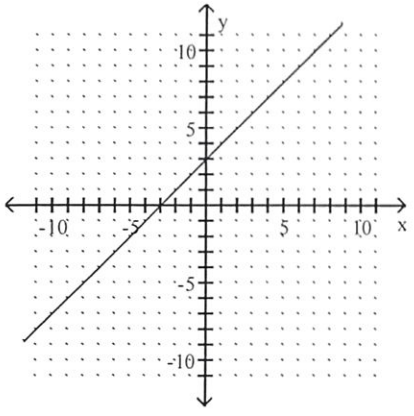
Graph the linear equation by finding and plotting its intercepts.

64) $-2x - 4y = 12$



State whether the slope of the line is positive, negative, 0, or is undefined.

65)



Find the slope of the line that passes through the points.

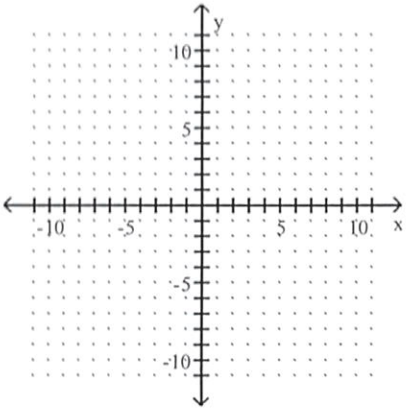
66) (-1, 10) and (2, -2)

Find the slope of the line.

67) $6x - 2y = 12$

Use the slope-intercept form to graph the equation.

68) $y = \frac{1}{2}x + 4$



Simplify the radical. Assume that all variables represent positive numbers.

69) $\sqrt{24x^2y}$

Add or subtract by first simplifying each radical and then combining any like radicals. Assume that all variables represent positive numbers.

70) $7\sqrt{18} - 2\sqrt{72}$

71) $-3\sqrt{18} - 7\sqrt{200} - 2\sqrt{128}$

72) $\sqrt{2x^2} - 3\sqrt{8x^2} + 6\sqrt{8x^2}$

Multiply and simplify. Assume that all variables represent positive real numbers.

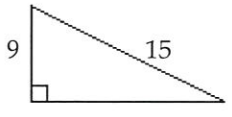
73) $4\sqrt{3}(\sqrt{11} + \sqrt{3})$

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

74) $\frac{9\sqrt{7}}{\sqrt{2}}$

Use the Pythagorean theorem to find the length of the unknown side of the right triangle. Give an exact answer.

75)



Solve the problem.

76) Scott set up a volleyball net in his backyard. One of the poles, which forms a right angle with the ground, is 7 feet high. To secure the pole, he attached a rope from the top of the pole to a stake 10 feet from the bottom of the pole. To the nearest tenth of a foot, find the length of the rope.