MAT 0028 *Review for the Department Final B*

Exponents & Order of Operations **In questions 1 - 6 simplify each expression.**

1. $-18 \div 3 \cdot 2 - 7$ **2.** $2\left[5 + 2(3-8)\right]$ **3.** $-|14| + |-8| - |3|$

4. $-4^2 - (2-5)^2 + 18$ **5.** $-\frac{2}{9} - \frac{1}{4}$ **6.** $\frac{12}{15} \div \left(-\frac{6}{5}\right)$

Evaluate Variable Expressions **Evaluate each expression when** $x = -2, y = 3$ **and** $z = -5$**.**

7. $2x^2 y - z$ **8.** $\frac{y^2 - 3x}{z}$ **9.** $4x^2 - 3x + 1$

Solve the linear equations

10. $-6x - 5 = 25$ **11.** $\frac{2}{3}x = -6$

12. $-4(2y+1) = -5y + 5$ **13.** $7(n-1) + 9 = 5n$

14. $-5y - 7 - y = -(2y + 3)$ **15.** $\frac{5}{2}x - 1 = x + \frac{1}{4}$

Problem Solving with Linear Equations

For each question use an algebraic equation to solve each problem.

16. The product of 8 and a number increased by 17 is the difference between three times the number and 8. Find the number.

17. Three times the sum of twice a number and 5 is –9. Find the number.

18. A 35-foot wire is to be cut in two pieces so that the longer piece is 4 times the shorter piece. Find the length of each piece.

Perimeter Problems

19. The length of a rectangular road sign is 2 feet less than four times its width. Find the dimensions if the perimeter is 36 feet.

20. If the length of a rectangular parking lot is 20 meters more than twice its width, and the perimeter is 400 meters, find the length of the parking lot.

Percent Problems

21. **Find 28% of 70.**

22. **27 is what percent of 150?**

23. **A dinner for two is $70 including tax. Find the total cost if a 15% tip is added to the cost.**

24. **Find the simple interest on $4200 for 2 years at 12%.**

25. **If you borrow $3000 for a used car from a friend and agree to pay it all back in 1 year with simple interest of 6%, how much interest will you owe? What will be the total amount you owe?**

Formulas

Solve for the indicated variable.

26. $V = 2Ah$ **for** A

27. $4x + y = 7$ **for** y

28. $2q + 3p = 5$ **for** p

Linear Inequalities

Solve each inequality

29. $-3x + 2 \le 17$

30. $4x - 5 > 2x - 1$

Rules of Exponents

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

31. $x^5 \cdot x^3$

32. $(-7a^4b)(4a^2b^3)$

33. $(-3a^3b)^2$

34. $\dfrac{12x^2}{6x^9}$

35. $\dfrac{27a^{10}b^4}{3a^7b^6}$

36. $(-5a^0b^2)^3$

37. $(5ab^2)^0$

38. 6^{-2}

39. $(x^3y^{-4})^{-1}$

40. $\dfrac{-12m^8n^{-6}}{4m^{-2}n^{-3}}$

Scientific Notation **Write each number in scientific notation.**

41. 75,000,000

42. 0.000256

Polynomials **Perform each indicated operation.**

43. $(8x^2+2x-7)+(-4x^2-5x-4)$

44. $(-6x^2+8xy-10y)-(6x^2-4xy+2y)$

45. $4x(6x^2-3x+5)$

46. $(3y-5)(2y-8)$

47. $(2x-9)(2x+9)$

48. $(10x-3)^2$

49. $\dfrac{-15a^4+21a^2-9a}{3a}$

50. $\dfrac{12x^5-8x^2-4x}{4x^2}$

Factoring **Factor each Polynomial.**

51. $20a-15$

52. $32xy^2-18x^2y$

53. $2y-8+xy-4x$

54. $4a^2-8ab-3a+6b$

55. $10r^2-9r+2$

56. $7x^2-4x-11$

57. $x^2-16x+64$

58. x^2-81

59. $9x^2-49$

60. $4a^2-25y^2$

61. $2x^2+20x+32$

62. $4x^3+4x^2-48x$

63. $2x^2-18$

Solve Quadratic Equations

64. $x^2+2x-63=0$

65. $5x^2-6x-8=0$

66. $9x^2+7x=2$

Simplify Rational Expressions

67. $\dfrac{7x-42}{x^2-6x}$

68. $\dfrac{3x^2-12}{6x-12}$

69. $\dfrac{x^2+7x+10}{2x^2+11x+5}$

Multiply and Divide Rational Expressions

70. $\dfrac{3x+6}{14}\cdot\dfrac{7x^2}{x^3+2x^2}$

71. $\dfrac{4x+8}{7x^2-14x}\cdot\dfrac{3x^2-5x-2}{9x^2-1}$

72. $\dfrac{7x^2}{6}\div\dfrac{x}{2y}$

Add and Subtract Rational Expressions

73. $\dfrac{2x^2+5x}{x+2}-\dfrac{4x+6}{x+2}$

74. $\dfrac{5}{8x}+\dfrac{11}{8x}$

75. $\dfrac{6x}{3x-5}-\dfrac{10}{3x-5}$

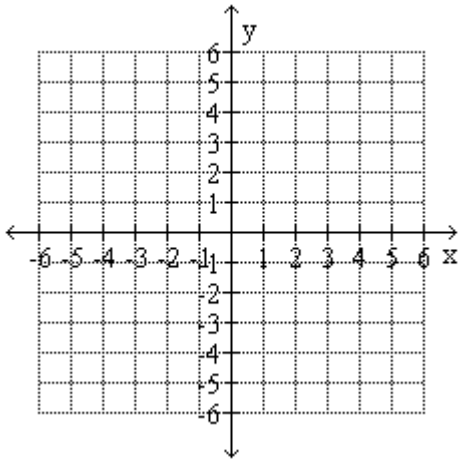
Proportions

76. A machine can process 300 parts in 20 minutes. Find how many parts can be processed in 45 minutes.

77. In a sample of 85 fluorescent bulbs, 3 were found to be defective. At this rate, how many defective bulbs should be found in 510 bulbs?

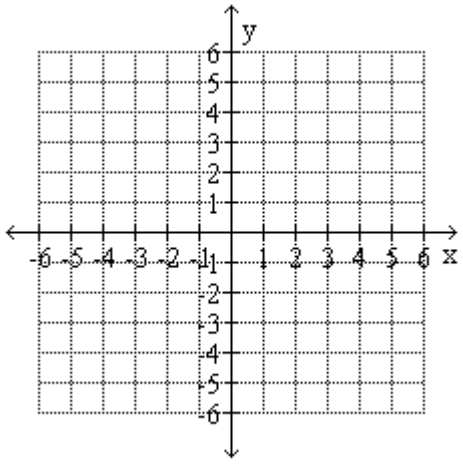
Graphing Linear Equations

78. For the equation $y = -4x + 2$ complete the table of ordered pairs. Then, use the ordered pairs to graph the equation.



x	y
0	
1	
2	

79. For the equation $y = 2x - 3$ find three ordered pair solutions by completing the table. Then, use the ordered pairs to graph the equation.



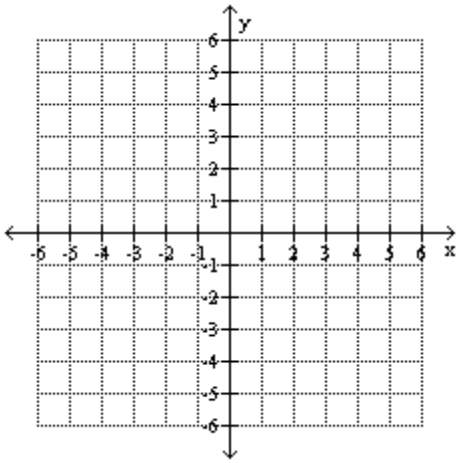
x	y

Finding the Intercepts of a Line

80. Identify the *x-intercept* of the graph of $2x - 5y = -10$. Write your answer as an ordered pair.

81. **Identify the *y-intercept* of the graph of** $2x-5y=-10$. **Write your answer as an ordered pair.**

82. **Graph** $2x+3y=-6$ **by finding and plotting its <u>intercepts</u>.**



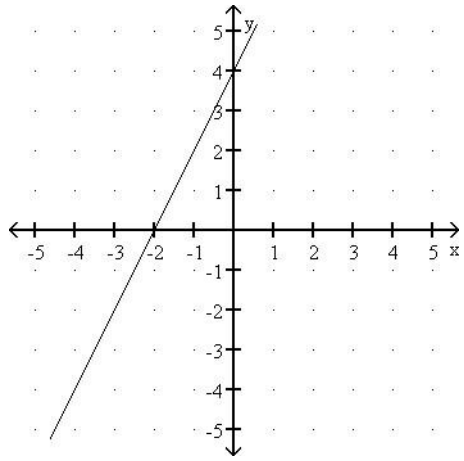
x	*y*

Slope

83. Find the slope of the line through (-1, 5) and (2, -3).

84. Find the slope of the line -2x + 3y = 11.

85. Use the points shown in the graph to find the slope of the line.



Square Root Radicals

Simplify. Assume that all variables represent positive numbers.

86. $\sqrt{x^{14}y^{20}}$ **87.** $\sqrt{36a^6b^2}$ **88.** $\sqrt{12a^4}$

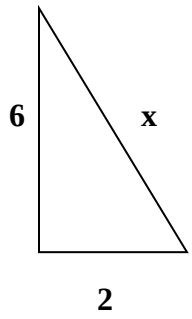
89. $\sqrt{40a^7b^3}$ **90.** $\sqrt{5}\left(\sqrt{7}-\sqrt{10}\right)$ **91.** $\sqrt{50}-\sqrt{8}$

92. $\sqrt{20}+2\sqrt{45}$ **93.** $\sqrt{2}(\sqrt{3}+\sqrt{2})$

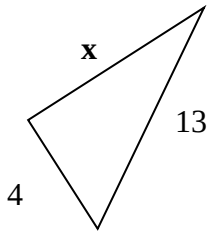
Pythagorean Theorem

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

94.



95.



96. A wire is used to anchor a 20 foot tall poll. One end of the wire is attached to the top of the pole. The other end is fastened to a stake five feet away from the bottom of the pole. Find the exact length of the wire.

Conversions

Use the table to convert each measurement as indicated.

US/Metric Linear Conversion Table

1 meter = 1.09 yards	**1 inch = 2.54 centimeters**
1 meter = 3.28 feet	**1 foot = 0.3048 meters**
1 kilometer = 0.62 miles	**1 mile = 1.61 kilometers**

97. 35 feet to meters

98. 5 meters to yards

99. 83 kilometers to miles

100. 12 inches to centimeters