CCNY MATH 80 Review Guide

Simplify each of the following:

8) $10 - 45 \div 5 + 4 \cdot (-7)$

9) $-4 \cdot 7 + 2 \cdot 5 - 16 \div 8$

10) -7^2

11) $2 \cdot \left(\frac{2}{5}\right)^{-3}$

12) $47 - 5(2-4)^3$

12.1) $\frac{5}{6} - \frac{1}{4} \cdot \left(\frac{2}{3}\right)^{-3}$

Evaluate for the given value(s).

13) $-10x^2 + 5y^2$ for x = 4, and y = - 8

14) $\frac{p^2q^3}{4}$ for p = 3, and q = -2

15) $\frac{a+b+c}{c}$ for a = -9, b = ½, and c = 5

Solve each equation.

16) $35 = 25 - \frac{1}{2}w$

17) $d + \frac{2}{3} = \frac{11}{5}$

18) $0.16 = k - 2.04$

19) $7w = 10$

20) $\frac{a}{12} = 12$

21) $10 = \frac{4n}{7}$

22) $\frac{9}{2}p = -6$

23) $\frac{x-3}{4} = \frac{5}{2} - x$

24) $4x - 12 = 64 + 2x$

25) $0 = x - 11 - 2x$

26) $4(x+7) = -64$

27) $-10 + 4(3x + 10) = 18$

Solve the equation for the variable specified.

28) $g = -3x - 4$, for x

29) $z = -\frac{3a}{2}$, for a

30) $u = k + a - b$, for a

31) $\frac{k}{x} = w + v$, for x

Graph each inequality and express in interval notation.

32) $x \geq -4$

33) $x < -\frac{5}{3}$

34) $x > \frac{3}{2}$

35) $-9 \geq x$

Solve each inequality. You do NOT have to graph the solution. Write the solution in interval notation.

36) $3(x-17) < 15$

37) $-2.2x \geq 11$

38) $5(x-11) > 14 + 5x$

39) $\frac{1}{2}(4x - 12) \geq 3x - 77$

Simplify using the distributive property

40) $\frac{1}{3}(9x - 30y) + \frac{4}{5}(-5x + 10y)$

41) $\frac{-1}{4}(-12x+8y)-\frac{1}{2}(-4x+2y)$

42) $2\left[8\left(\frac{1}{2}a-b\right)+3(3a-b)\right]$

43) $(3x-6z)2+13z$

Simplify

44) $\frac{2}{11}\cdot\frac{33}{10}$

45) $\frac{\frac{1}{6}}{2}$

46) $\frac{8}{9}\div\frac{5}{9}$

47) $\frac{12x}{72}$

Tell whether the given value is a solution of the inequality. Answer YES or NO.

48) $-5x>16 \quad x=-9$

49) $\frac{3}{5}(x+50)\leq 40 \quad x=17$

50) $2x>3x \quad x=-1$

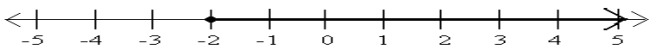
51) $2x>3x \quad x=10000$

Solve each inequality. Express your solution in interval notation.

52) $3(2x-7)\geq 6x+2$

53) $\frac{5}{7}x<7$

57) What inequality represents the given graph?



A.) $x<-2$ B.) $x>-2$ C.) $x\leq -2$ D.) $x\geq -2$

59) If $a=\frac{1}{3}$ and $b=-15$, what is the value of $-2ab$?

60) Find the slope of the line that passes through the points (-6, 8) and (3, -7) and sketch the line on graph paper.

61) Identify the x and *y* intercepts of the equation $3x-4y=30$. Also find its slope and sketch the line on graph paper.

62) Convert the equation $x+2y=-12$ into slope-intercept form. Identify the slope and *y* intercept.

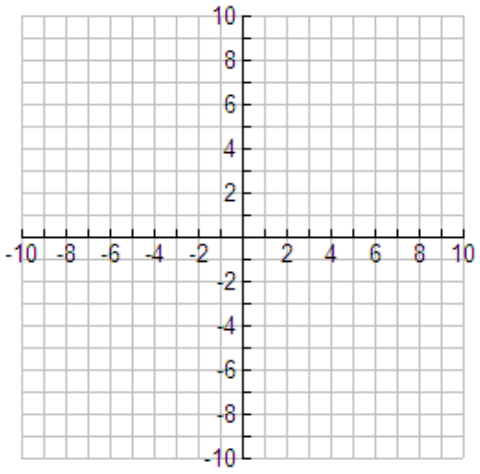
63) Find an equation of the line that passes through the points (-6, -14) and (2, 2).

64) What is the slope of the line that passes through the points (8, -3) and (8, 5)? Find its equation and sketch it.

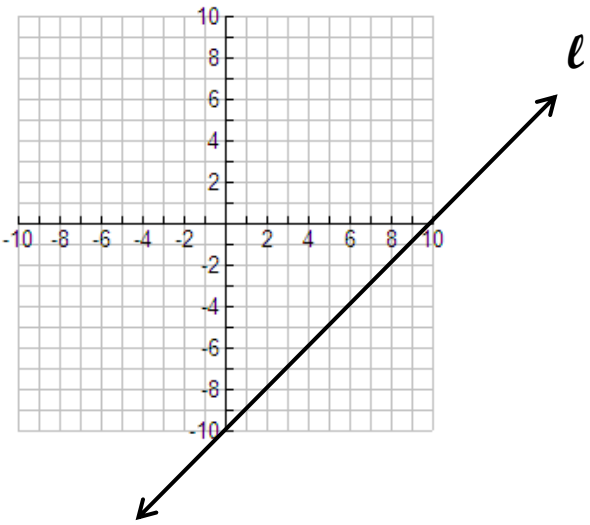
65) What is the slope of the line that passes through the points (1, -6) and (10, -6)? Find its equation and sketch it.

66) What is the slope of any line that is parallel to the line $y = \frac{1}{3}x - 17$?

68) Graph the equation $2x + 5y = 20$

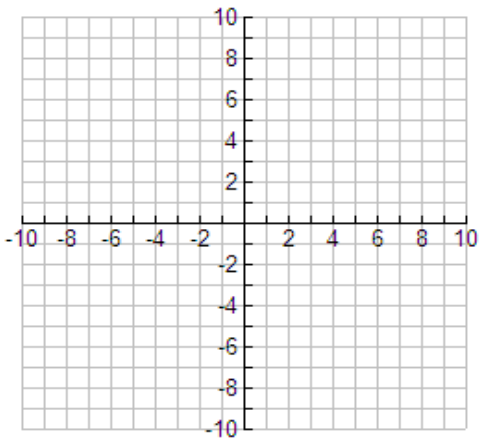


69) What is the equation of line l shown below?

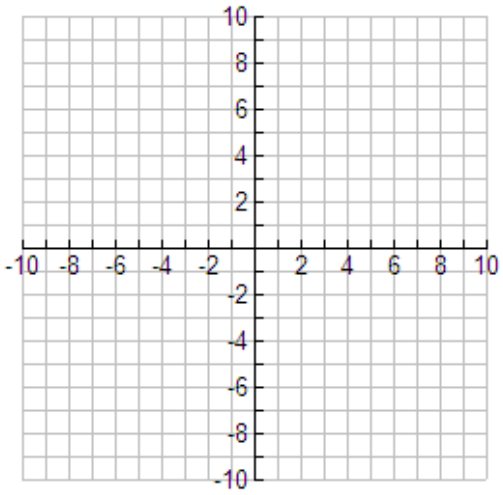


Solve each system by graphing

70) $y = 2x + 8$
$y = -\frac{1}{2}x - 2$



71) $\begin{matrix} x - 3y = -3 \\ x = 9 \end{matrix}$



Solve each system using either substitution or elimination.

72) $\begin{matrix} 2x - 5y = -51 \\ y = -6x + 7 \end{matrix}$

73) $\begin{matrix} y = x + 3 \\ 3x - y = 7 \end{matrix}$

74) $\begin{matrix} -4x + 9y = 9 \\ x - 3y = -6 \end{matrix}$

75) $\begin{matrix} 5x + 4y = -14 \\ 3x + 6y = 6 \end{matrix}$

Rewrite each expression multiplied (or divided), combining like terms and without negative exponents, if that applies.

76) $3x + 9x - 15x + 3y + 17y$

77) $x \cdot x \cdot x \cdot x \cdot x \cdot x$

78) $3x \cdot 12x$

79) $-9x \cdot 2y \cdot 4xy$

80) $-10x^4 \cdot 2x^5$

81) $5(x^3)^{-2}$

82) $(-2x^6)^3 \cdot (x^2)^5$

83) $9x(-x^2 + 4x - 5)$

84) $-2ab^2(5a - 2ab + 4b)$

85) $\dfrac{-90a^2b^{-7}}{-72a^{-3}}$

86) $\dfrac{8x^2}{40x^7}$

87) $(x + 4)(x - 9)$

88) $(3x - 7)(x^2 + x - 10)$

89) $(2x - 1)^2$

90) 9^{-1}

91) $2x^{-5}$

92) $(-3x)^0$

93) $-7x^0$

93.1) $\frac{(2x^2y^{-3})^4 \cdot y^2}{2x^{-3}}$

93.2) $-2x(-3x^2 - 9x + 7) \; - \; (2x^2 - x)$

Greatest Common Factor

94) The GCF of 52 and 400 is:

95) The GCF of $18x^3y$ and $10x^2y^3$:

96) The GCF of $16x^5$ and $14x^3$ is:

Factoring

97) Factor $-6y^3z^2 + 32y^2z^2$

98) Factor $9a - 18a^2$

99) Factor $x^2 - 100$

100) Factor $49x^2 - 81z^2$

101) Factor $28 - 63y^2$

102) Factor $x^2 - 10x - 39$

103) Factor $x^2 - 15x + 14$

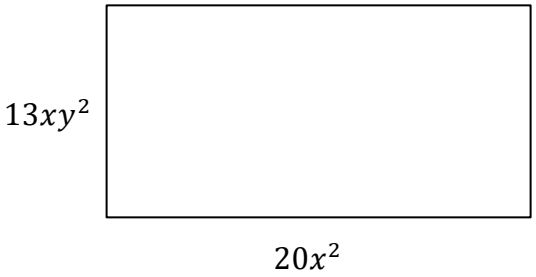
104) Factor $x^2 + 3x - 180$

105) Factor $x^2 + 11x + 30$

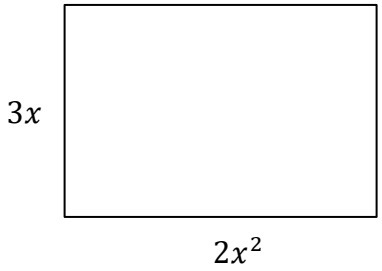
106) Factor $x^2 + 3x - 24$

106.1) Factor $7x^2 - 175x^4$

107) Find the area and perimeter of the rectangle below in terms of x and y.



108) What is the perimeter of the rectangle above if $x = \frac{5}{2}$?



Solve each Equation using the stated method.

By taking square roots:

109) $x^2 = 18$

110) $2x^2 - 128 = 0$

By Factoring:

111) $x^2 - 3x = 18$

112) $x^2 = -22x - 120$

113) $x^3 = 8x^2 - 16x$

114) $3x^3 = 75x$

By completing the square:

115) $x^2 = x + 42$

116) $-9 = x^2 + 10x$

117) $x^2 = 3x + 5$

118) $x^2 - \frac{1}{2}x = 1$

Simplify the radical expressions, rationalizing denominators where appropriate.

119) $8\sqrt{20}$

120) $5\sqrt{3} \cdot \sqrt{30}$

121) $\sqrt{128}$

122) $-62\sqrt{8}$

123) $-9\sqrt{7} \cdot 4\sqrt{21}$

124) $\sqrt{48x^{12}y^{21}}$

125) $\frac{\sqrt{20}}{\sqrt{5}}$

126) $\frac{10}{\sqrt{2}}$

127) $\frac{9}{\sqrt{6}}$

128) $\sqrt{\frac{1}{2}}$

129) $16\sqrt{60} - \sqrt{135}$

130) $17\sqrt{22} + 40\sqrt{22} - 12\sqrt{22}$

131) $10\sqrt{2} \cdot (\sqrt{2} - \sqrt{6})$

132) $\sqrt{20x^{13}y^{16}}$

133) $(5 - \sqrt{14})(5 + \sqrt{14})$

133) $\frac{1}{\sqrt{2}-1}$

134) $\frac{3}{\sqrt{7}+2}$

135) $\frac{6}{\sqrt{11}-\sqrt{2}}$

More Geometry:

136) Given a right triangle with hypotenuse length $\sqrt{26}$ and base length 3, find the length of the other leg (which is also the height).

137) Referring to the triangle in 136), find the perimeter and the area of the triangle.

138) If one of the acute angles in a right triangle has 12 degrees less than twice the other acute angle, find the two acute angles.

139) A tree casts a shadow 15 feet long. At the same time a 6-foot tall person casts a shadow of $1\frac{1}{2}$ feet. How tall is the tree?

Equations with square root expressions:

140) $\sqrt{2x+9} + x = 13$

141) $x - \sqrt{9-x} = 7$

142) $x + \sqrt{24-5x} = 6$