

Summer Packet (2022 - 2023)

Date _____ Period _____

ALL WORK IS TO BE DONE ON THE PACKET**You will detach this portion from the packet and turn it in to your teacher on August 18, 2022****Simplify the radicals.**

1) $\sqrt{320n}$

2) $\sqrt{384x^3yz^2}$

3) $\sqrt{24xy^4}$

4) $8\sqrt[5]{320x}$

5) $-2\sqrt{12} + 3\sqrt{12} - 3\sqrt{12}$

6) $2\sqrt{24} - \sqrt{12} - \sqrt{3}$

7) $2\sqrt[6]{6} + 3\sqrt[6]{320} - 2\sqrt[6]{384}$

8) $3\sqrt[5]{96} + 2\sqrt[5]{160} + 3\sqrt[5]{160}$

9) $\sqrt{10}(4\sqrt{5} + \sqrt{6})$

10) $(-4\sqrt{2} - \sqrt{3r})(2\sqrt{2r} - 5\sqrt{3})$

Simplify the complex numbers.

11) $(8 + 8i) + (-2 + 6i)$

12) $(2 - i) + (8 - 2i)$

13) $(-3 + 5i) + (7 + 4i)$

14) $(-2 - 5i) + (8 - 2i)$

15) $(3 - 6i)^2$

16) $(i)(3i)(7 + 8i)$

17) $(-7 - 7i)(3 - i)$

18) $-7(4i)(-7 + 5i)$

Rationalize the complex number.

19) $\frac{2 + 4i}{5 + 4i}$

20) $\frac{5i}{5 - 5i}$

Evaluate each function.

21) $f(x) = -2x + 2$; Find $f(5)$

22) $f(a) = a^2 + 5a$; Find $f(2)$

23) $h(a) = 2a - 5$; Find $h(-2)$

24) $f(n) = n - 1$; Find $f(0)$

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

25) Slope = $-\frac{3}{5}$, y-intercept = 0

26) Slope = $\frac{3}{2}$, y-intercept = 1

27) Slope = 2, y-intercept = -5

28) Slope = $\frac{7}{4}$, y-intercept = 4

Write the standard form of the equation of the line through the given points.

29) through: (0, 1) and (1, 2)

30) through: (-3, -1) and (5, -2)

Write the standard form of the equation of the line described.

31) through: $(4, 4)$, parallel to $y = \frac{9}{4}x$

32) through: $(3, 4)$, perp. to $y = -\frac{3}{5}x - 4$

Write the point-slope form of the equation of each line through the given point and slope.

33) through: $(-2, -4)$, slope = $\frac{3}{2}$

34) through: $(5, -3)$, slope = $-\frac{7}{5}$

35) through: $(-3, 5)$, slope = $-\frac{9}{2}$

36) through: $(5, 3)$, slope = 0

Find the distance between each pair of points.

37) $(-5\sqrt{3}, 1)$, $(\sqrt{3}, 5)$

38) $(-1, 8)$, $(8, -6)$

Find the midpoint of the line segment with the given endpoints.

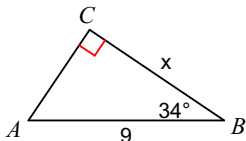
39) $\left(-\frac{17}{8}, -\frac{19}{6}\right)$, $\left(\frac{25}{6}, \frac{3}{2}\right)$

Given the midpoint and one endpoint of a line segment, find the other endpoint.

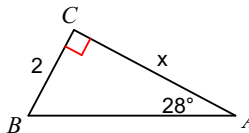
40) Endpoint: $\left(\frac{5}{8}, \frac{27}{8}\right)$, midpoint: $\left(-\frac{7}{6}, -\frac{10}{3}\right)$

Find the measure of each side indicated. Round to the nearest tenth.

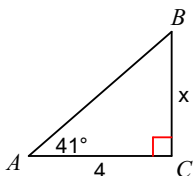
41)



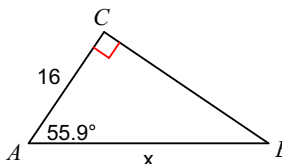
42)



43)

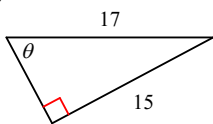


44)

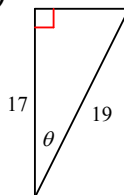


Find the value of the trig function indicated. Answers should be written as fractions.

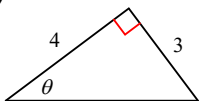
45) $\sin \theta$



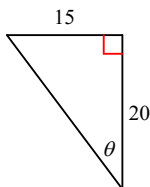
46) $\cos \theta$



47) $\cos \theta$



48) $\cos \theta$



Solve each system by elimination or substitution. Write answers in the form (x,y).

$$49) \begin{aligned} -3x + 8y &= -7 \\ -6x + 10y &= -20 \end{aligned}$$

$$50) \begin{aligned} -9x + 6y &= -3 \\ -8x + 12y &= 24 \end{aligned}$$

$$51) \begin{aligned} 6x + 6y &= 12 \\ 8x + 10y &= 4 \end{aligned}$$

$$52) \begin{aligned} y &= -6x + 19 \\ 6x - y &= 5 \end{aligned}$$

Write the system of equations for each scenario and solve. Write your answer within context.

53) When you reverse the digits in a certain two-digit number you decrease its value by 45. Find the number if the sum of its digits is 7.

54) The sum of the digits of a certain two-digit number is 6. Reversing its digits decreases the number by 54. Find the number.

Simplify the following expressions. Your answer should contain only positive exponents.

$$55) 3y \cdot 2x^2y^2$$

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

$$57) (3x^2y^3)^3$$

$$58) (x^{-1}y^2)^4$$

Write each expression in radical form.

59) $4^{\frac{5}{3}}$

60) $2^{\frac{1}{6}}$

61) $(4k)^{-\frac{2}{3}}$

62) $(2m^2)^{\frac{1}{6}}$

Write each expression in exponential form.

63) $(\sqrt{5})^5$

64) $\frac{1}{(\sqrt[6]{10})^7}$

65) $\frac{1}{\sqrt[3]{7n}}$

66) $\frac{1}{(\sqrt[5]{10n})^2}$

Simplify each expression.

67) $(8b^4 + 3b^3 - 4b^2) + (b^3 - 8b) - (8b^2 + 8b^4 + 7b - 5b^3)$

68) $(8 + 7x^4) + (2x^4 + 5)$

Find each product using distribution.

69) $(2b + 3)(7b + 1)$

70) $(2b + 1)(4b^2 - 3b + 4)$

71) $(5 + 3a)(5 - 3a)$

72) $(4x + 6)^2$

Factor each completely.

73) $28v^3 + 12v^2 + 140v + 60$

74) $16a^2 - 9b^2$

75) $18m^2 - 2$

76) $864x^3 + 4$

77) $1 - 125x^3$

78) $-m^2a^2 - 5ma^2n + 50n^2a^2$

Find the value of c that completes the square.

79) $a^2 - 17a + c$

Find the value that completes the square and then rewrite as a perfect square.

80) $x^2 - 30x + \underline{\hspace{1cm}}$

Solve each equation by completing the square.

81) $x^2 + 4x - 60 = 0$

82) $x^2 - 4x - 51 = 0$

Solve each equation by factoring.

83) $x^2 + 7x + 10 = 0$

84) $x^2 + 6x + 9 = 0$

85) $x^2 - x - 20 = 0$

86) $x^2 - 7x + 10 = 0$

Solve each equation with the quadratic formula.

87) $5n^2 + 2n - 131 = 4$

88) $9a^2 - 11a = -6$

89) $4p^2 - 15 = 7p$

90) $4v^2 = 3v + 21$

Find the discriminant of each quadratic equation then state the number and type of solutions.

91) $8k^2 - 2k - 1 = 0$

92) $8x^2 - 3x + 8 = 0$

93) $n^2 + 6n - 7 = 0$

94) $6n^2 + 1 = 0$

Find the inverse of each function.

95) $g(x) = -\frac{2}{9}x - \frac{10}{9}$

96) $f(x) = \frac{20 + x}{5}$

97) $h(x) = 7x + 5$

98) $g(x) = -\frac{2}{x - 2}$

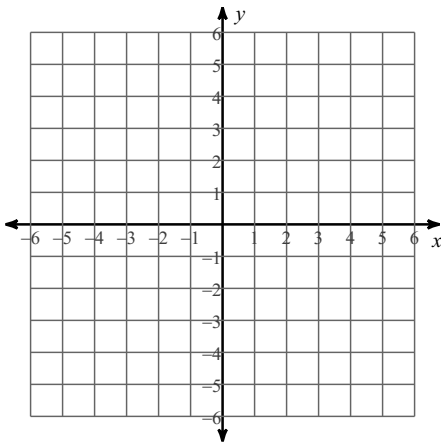
State if the given functions are inverses.

99) $f(x) = -2x$
 $g(x) = -\frac{5x}{4}$

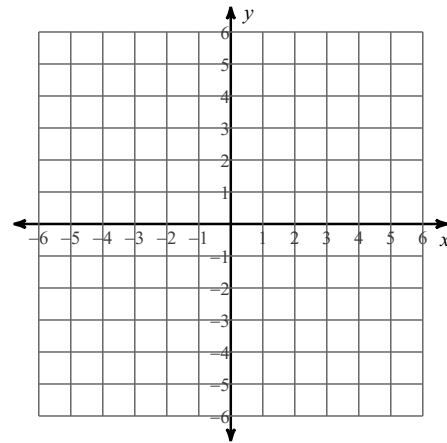
100) $h(n) = \frac{1}{-n + 3} + 2$
 $f(n) = -\frac{1}{n - 2} + 3$

Graph each equation.

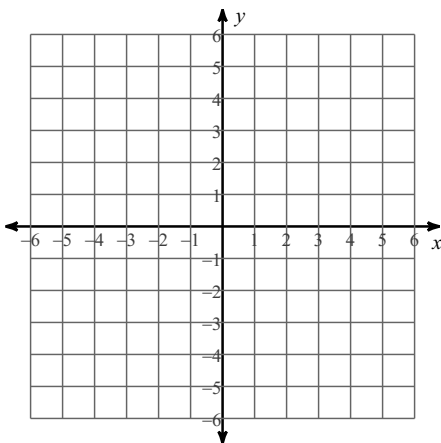
101) $y = |x| + 3$



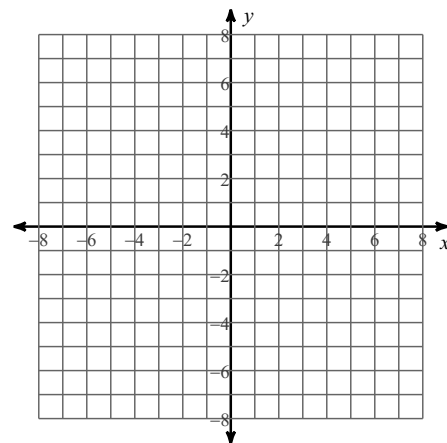
102) $y = \frac{1}{3}x - 2$



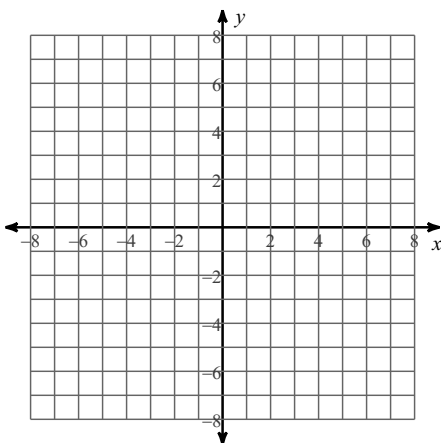
103) $x - 4y = 8$



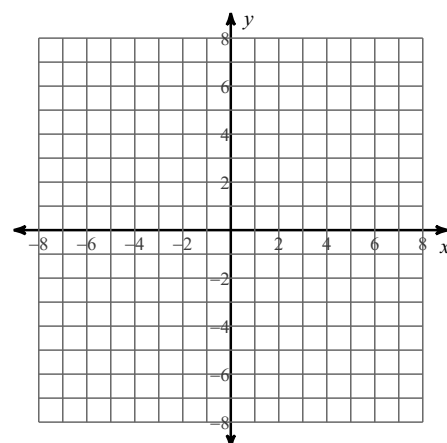
104) $y = (x + 2)^2 - 4$



105) $y = \sqrt{x - 4} + 1$



106) $f(x) = -\frac{2}{x + 1} + 2$



State the transformations that have occurred.

107) $y = -2|x| + 4$

108) $y = -(x + 10)^2 - 5$

109) $y = \frac{3}{4}\sqrt{x + 3} - 5$

110) $f(x) = \frac{1}{x + 1} + 2$

Identify the vertex, axis of symmetry, and direction of opening of each.

111) $y = 2x^2 + 28x + 105$

112) $y = -20x^2 + 400x - 1993$

113) $y = \frac{5}{6}x^2 - \frac{50}{3}x + \frac{250}{3}$

114) $y = -x^2 - 14x - 43$

Divide using long division.

$$115) \frac{10b^3 - 23b^2 - 29b + 24}{b - 3}$$

$$116) \frac{x^3 + 13x^2 + 32x - 16}{x + 4}$$

$$117) \frac{6x^4 - 12x^3 - 4x}{x - 2}$$

$$118) \frac{9p^3 - 6p^2 - 1}{9p - 6}$$

Evaluate each composition function.

119) $h(x) = 4x + 3$; Find $h(-3 - x)$

120) $h(x) = x^3 - 4$; Find $h(x^2)$

121) $k(n) = 3|n|$; Find $k(n - 1)$

122) $w(x) = 3^x$; Find $w(x - 4)$

Simplify each expression.

123) $\frac{6x - 3y}{20x^2y} + \frac{5x - 4y}{20x^2y}$

124) $\frac{4u + 2v}{20v^2} - \frac{5u + 3v}{20v^2}$

125) $\frac{5}{k - 6} + \frac{2}{k - 5}$

126) $\frac{2}{4} - \frac{3}{6x}$

Solve each equation. Remember to check for extraneous solutions.

$$127) \frac{2}{x^2 - x - 12} - \frac{4}{x + 3} = \frac{1}{x^2 - x - 12}$$

$$128) \frac{m + 1}{2m} - \frac{5}{2m^2} = \frac{m - 1}{2m}$$

Simplify each expression.

$$129) \frac{\frac{5}{x}}{\frac{4}{\frac{5}{5}}}$$

$$130) \frac{\frac{1}{4}}{\frac{x^2}{4}}$$

$$131) \frac{\frac{2}{x^2}}{\frac{2}{2} + \frac{5}{x}}$$

$$132) \frac{\frac{3}{m} - \frac{m}{3}}{\frac{16}{3}}$$

Condense each expression to a single logarithm.

133) $\log_7 x + \log_7 y + 6\log_7 z$

134) $4\log_9 8 - 2\log_9 11$

Expand each logarithm.

135) $\log_4 \left(\frac{u^3}{v} \right)^4$

136) $\log_3 (5^4 \cdot 11^2)$

Rewrite each equation in exponential form.

137) $\log_{36} 6 = \frac{1}{2}$

Rewrite each equation in logarithmic form.

138) $15^2 = 225$

Rewrite each equation in exponential form.

139) $\log_{\frac{7}{6}} y = x$

Rewrite each equation in logarithmic form.

140) $u^v = \frac{53}{40}$

Using change of base formula approximate each to the nearest thousandth.

141) $\log_5 33$

142) $\log_6 31$