

Summer Packet

Simplify.

1) $-\sqrt{64}$

3) $5\sqrt{64}$

5) $-5\sqrt{384n^2}$

7) $3\sqrt[3]{-750x^9}$

9) $\sqrt[3]{40n^3}$

2) $3\sqrt{32}$

4) $2\sqrt{48}$

6) $8\sqrt{576a^4}$

8) $9\sqrt{640a^5}$

10) $\sqrt[4]{64x^8}$

Write each expression in exponential form.

11) $(\sqrt[6]{2p})^5$

13) $(\sqrt[3]{4b})^5$

15) $(\sqrt[3]{7v})^4$

17) $(\sqrt{p})^5$

12) $(\sqrt{10n})^3$

14) $(\sqrt{2b})^5$

16) $\sqrt[3]{m}$

18) $(\sqrt[3]{3x})^2$

Write each expression in radical form.

19) $(3n)^{\frac{7}{5}}$

21) $(6x)^{\frac{4}{3}}$

23) $(6n^2)^{-\frac{1}{3}}$

25) $(6x)^{-1.5}$

20) $(10r)^{\frac{3}{2}}$

22) $(3a)^{\frac{3}{2}}$

24) $(10m)^{\frac{1}{6}}$

26) $(3x)^{\frac{5}{4}}$

Simplify.

27) $-2\sqrt[3]{16} + 2\sqrt[3]{54} - 3\sqrt[3]{32}$

29) $-3\sqrt{6}(4 + \sqrt{3})$

31) $\sqrt{6}(2\sqrt{2} - \sqrt{6})$

33) $\frac{4}{5 - \sqrt{3}}$

35) $-\frac{5}{5 - 4\sqrt{3}}$

28) $-3\sqrt{6} - 2\sqrt{24} - \sqrt{12}$

30) $\sqrt{15}(\sqrt{5} + 2)$

32) $(2\sqrt{2} - 1)(-4\sqrt{2} - 3)$

34) $\frac{4\sqrt{2}}{\sqrt{2} + \sqrt{5}}$

36) $\frac{2}{-4 - 4\sqrt{5}}$

Solve each equation.

37) $\frac{|9a - 8|}{8} = 3$

39) $\frac{|6 + 10x|}{7} = 3$

41) $4 + 7|-10m - 1| = 67$

38) $-10|4a + 6| = 100$

40) $\frac{|4 + 5x|}{2} = 2$

42) $-2 - |-9 + 4n| = -33$

43) $5 - 10|-3n + 2| = -5$

44) $5|7 - 4x| + 4 = -1$

Solve each inequality and graph its solution.

45) $|x + 4| < 2$

46) $|x + 10| > 4$

47) $|2r + 10| - 1 \geq 5$

48) $2 + |10k - 2| \geq 24$

Solve each equation by factoring.

49) $p^2 - 64 = 0$

50) $6r^2 - 36r = 96$

51) $a^2 - 12 = -4a$

52) $p^2 = -5p$

53) $49r^2 + 70r + 31 = 7$

54) $3n^2 + 20n = 7$

55) $12n^2 - 36 = 4 - 4n$

56) $7x^2 - 48x + 12 = -4x$

Solve each equation by taking square roots.

57) $9m^2 - 5 = 328$

58) $3b^2 - 5 = 199$

Solve each equation with the quadratic formula.

59) $10n^2 - 3 = 5n$

60) $4x^2 = -3 - 9x$

Solve each equation by completing the square.

61) $x^2 + 14x + 16 = 3$

62) $n^2 - 4n - 52 = -7$

Simplify each expression.

63) $(7x - 4x^3 - x^4) - (x^3 + 4x^4 - 5x)$

64) $(8v^2 + 3v^4 + v^3) + (v^3 + 8v^2 - 7v^4)$

65) $(5x^3 + 8x^2 + 2) + (2x^3 + 2 - 3x^2)$

66) $(3 + 6x^2 - 3x^4) - (x^4 + 7 + 2x^3)$

Find each product.

67) $(8m - 3)(7m^2 + 6m - 3)$

68) $(2x + 1)(4x^2 + 8x - 6)$

69) $(-7x + 8)(2x^2 + 7x - 8)$

70) $(-8a + 3)(-2a^2 - 8a - 3)$

71) $(1 + 7m)^2$

72) $(7x - 3)(7x + 3)$

73) $(5b + 8)(5b - 8)$

74) $(6 + 7v)^2$

Divide.

75) $(m^4 + 14m^3 + 52m^2 + 57m - 44) \div (m + 9)$

76) $(10m^3 + 48m^2 + 36m + 8) \div (m + 4)$

77) $(n^3 - 9n^2 + 4n + 16) \div (n - 2)$

78) $(x^4 - 10x^3 + 21x^2 + 29x - 49) \div (x - 5)$

79) $(7k^4 + 31k^2 - 16 - 3k^3 - 22k) \div (7k + 4)$

80) $(68x - 18x^2 - 8x^4 - 28 + 16x^5 - 43x^3) \div (-7 + 4x)$

Factor each.

81) $x^4 - 8x^3 + 7x^2 = 0$

82) $x^3 + 64 = 0$

83) $x^3 - 125 = 0$

84) $x^3 - 2x^2 - x + 2 = 0$

Describe the end behavior of each function.

85) $f(x) = -x^5 + 3x^3$

86) $f(x) = x^4 - 4x^2 - 3x + 1$

87) $f(x) = -x^3 + 2x^2$

88) $f(x) = 2x^2 - 16x + 32$

Sketch the general shape of each function.

89) $f(x) = x^2 + 6x + 3$

90) $f(x) = x^3 - 6x^2 + 9x - 5$

91) $f(x) = -x^4 + x^2 + x + 2$

92) $f(x) = -x^3 + 4x^2 - 6$

Find all zeros.

93) $f(x) = 5x^3 - 19x^2 - 4x$

94) $f(x) = 3x^3 + 13x^2 + 4x$

95) $f(x) = x^3 - 11x^2 - 3x$

96) $f(x) = 5x^3 - 13x^2 - 6x$

Sketch the graph of each function. State the number of real zeros. Approximate the relative minima and relative maxima to the nearest tenth.

97) $f(x) = x^2 - 4x - 2$

98) $f(x) = x^2 - 8x + 15$

99) $f(x) = x^2 + 2x - 2$

100) $f(x) = x^2 - 6x + 9$

Simplify each expression.

101) $\frac{x+1}{6x^2+36x} - \frac{2x}{6x^2+36x}$

102) $\frac{x+1}{x^2+6x+5} - \frac{x+3}{x^2+6x+5}$

103) $\frac{a-3}{6a^2-6a} - \frac{5}{3}$

104) $\frac{5}{n^2+6n+5} + \frac{3n}{2}$

105) $\frac{n+3}{12n-12} + \frac{3}{2}$

106) $\frac{4p}{3p-3} + \frac{2}{p-2}$

107) $\frac{3v^2}{v+1} \cdot \frac{v^2+4v+3}{v+4}$

108) $\frac{-x^2+15x-50}{x+1} \cdot \frac{x+1}{x^2-2x-15}$

109) $\frac{n+8}{5n^2+40n} \div \frac{n-3}{5n^2-5n}$

110) $\frac{r^2+3r-18}{r-9} \div \frac{r^2+5r-24}{r-9}$

Simplify each and state the excluded values.

111) $\frac{5k+15}{k+3}$

112) $\frac{4x-6}{8}$

113) $\frac{6v^2-3v}{6v^2}$

114) $\frac{x-2}{4x^2-8x}$

115) $\frac{48r-6r^2}{r^2-2r-48}$

116) $\frac{x^2+2x-35}{6x^2+42x}$

117) $\frac{10x-70}{x^2-16x+63}$

118) $\frac{k^2+9k+14}{k^2+11k+28}$

Solve each equation. Remember to check for extraneous solutions.

119) $\frac{1}{b} = \frac{1}{2b} - \frac{1}{2}$

120) $\frac{1}{6k^2} + \frac{k-4}{6k^2} = \frac{1}{k}$

121) $\frac{1}{3n-2} + 1 = \frac{3}{3n-2}$

122) $\frac{5n-30}{n+4} = \frac{1}{n+4} - 1$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

123) $\left(mn^{\frac{2}{3}}\right)^{\frac{5}{3}} \cdot m^{\frac{1}{2}}n^{-2}$

124) $\left(yx^{-2} \cdot x^{\frac{7}{4}}y^{\frac{1}{2}}\right)^2$

125) $x^3 \cdot \left(x^{\frac{1}{4}} y^{-2}\right)^0$

126) $m^0 n^3 \cdot m^{-2}$

127) $\left(x^{-\frac{5}{4}} y^{\frac{7}{4}}\right)^{-\frac{1}{3}} \cdot x^{\frac{7}{4}} y^{\frac{1}{2}}$

128) $ba^2 \cdot \left(a^{-\frac{3}{2}}\right)^0$

129) $\frac{mn^{\frac{1}{2}}}{\left(nm^{\frac{1}{3}}\right)^{-2} \cdot mn^{-\frac{1}{4}}}$

130) $\frac{a^{-\frac{1}{3}} \cdot b}{\left(a^{\frac{5}{3}} b^{-2}\right)^0}$

Solve each equation. Remember to check for extraneous solutions.

131) $\sqrt{-24 + 11m} = m$

132) $\sqrt{r - 8} = 3$

133) $x = \sqrt{6 - x}$

134) $v - 1 = \sqrt{3v - 5}$

Expand each logarithm.

135) $\log_8 (u^5 \cdot v)^3$

136) $\log_5 (uv^2)^6$

137) $\log_7 (x^4 \cdot y)^6$

138) $\log_4 \sqrt[3]{a \cdot b \cdot c}$

Condense each expression to a single logarithm.

139) $3 \log_4 z + 15 \log_4 x + 3 \log_4 y$

140) $\log_2 y + \log_2 z + \log_2 w + \frac{\log_2 x}{3}$

141) $12 \log_8 10 + 6 \log_8 3 + 6 \log_8 11$

142) $3 \log z + 3 \log x + 15 \log y$

Solve each equation.

143) $\log (p + 10) = \log (-5p - 4)$

144) $\log (-2b + 10) = \log (2b + 2)$

145) $-3 + \log_8 7x = -1$

146) $10 \log_6 (x + 4) = -10$

147) $1 + \log_2 (n + 2) = 5$

148) $-4 + \log_4 3k = -5$

149) $\log x + \log 9 = \log 35$

150) $\log x - \log 2 = \log 34$

151) $\log_7 (x + 4) + \log_7 10 = 1$

152) $\log_5 (x + 4) + \log_5 x = 1$

Find the inverse of each function. Then graph the function and its inverse.

153) $f(x) = -2 - \frac{3}{2}x$

154) $f(x) = \frac{1}{3}x - \frac{8}{3}$

155) $g(x) = \sqrt[3]{x + 3} - 1$

156) $f(x) = (x + 1)^3$

Perform the indicated operation.

157) $f(x) = -2x$
 $g(x) = x^3 - 3x$
Find $f(x) \cdot g(x)$

158) $g(x) = x^2 + 1$
 $h(x) = 3x - 1$
Find $g(x) \cdot h(x)$

159) $g(x) = 2x + 2$
Find $g(g(x))$

160) $g(t) = -t - 2$
 $h(t) = t^3 - 5t^2$
Find $g(h(t))$

$$161) \begin{aligned} h(n) &= 2n + 3 \\ g(n) &= -3n^3 + n^2 \\ \text{Find } 4h(n) - 4g(n) \end{aligned}$$

$$162) \begin{aligned} g(n) &= 3n - 5 \\ h(n) &= n^2 - 1 + 2n \\ \text{Find } 2g(n) + 5h(n) \end{aligned}$$

$$163) \begin{aligned} g(x) &= x + 3 \\ h(x) &= 2x \\ \text{Find } g(h(-7)) \end{aligned}$$

$$164) \begin{aligned} g(t) &= -3t^2 + 3t \\ h(t) &= 4t - 4 \\ \text{Find } g(h(3)) \end{aligned}$$

$$165) \begin{aligned} g(n) &= n^3 - 2n^2 \\ f(n) &= 2n + 4 \\ \text{Find } 3g(5) - 5f(5) \end{aligned}$$

$$166) \begin{aligned} f(t) &= t^3 + 2t^2 + 2t \\ g(t) &= 3t + 3 \\ \text{Find } -5f(2) - 4g(2) \end{aligned}$$

Identify the center and radius of each. Then sketch the graph.

$$167) (x - 1)^2 + (y + 4)^2 = 1$$

$$168) (x + 2)^2 + (y + 2)^2 = 6$$

Identify the vertex, axis of symmetry, min/max value, y-intercept, and x-intercepts of each. Then sketch the graph.

$$169) f(x) = x^2 + x - 6$$

$$170) f(x) = x^2 - 3x + 2$$

$$171) f(x) = -x^2 + 4x$$

$$172) f(x) = -x^2 + 4$$

Graph each equation.

$$173) y = |2x| + 3$$

$$174) y = -|3x - 2| + 2$$

$$175) y = |3x + 4| + 4$$

$$176) y = -|-2x + 2|$$

Using an online graphing calculator, sketch the graph of each function.

$$177) f(x) = -2x^2 - 12x - 20$$

$$178) f(x) = x^4 - 4x^2 + 2x + 1$$

$$179) f(x) = x^5 - 4x^3 + 4x + 1$$

$$180) f(x) = x^3 - x^2 - 4$$

Graph each function.

$$181) f(x) = -\frac{1}{x + 2} - 2$$

$$182) f(x) = \frac{2}{x + 3} - 2$$

Identify the vertical asymptotes and horizontal asymptote of each. Then sketch the graph with an online calculator.

$$183) f(x) = \frac{x^2 + 6x + 8}{3x^2 - 9x}$$

$$184) f(x) = \frac{3x + 12}{x^2 + 2x - 3}$$

Sketch the graph of each function.

$$185) y = -5 + \sqrt{x}$$

$$186) y = \sqrt{x + 4}$$

$$187) y = \sqrt[3]{x - 1}$$

$$188) y = \sqrt[3]{x} - 3$$

$$189) f(x) = \left(\frac{1}{2}\right)^{x+1} + 1$$

$$190) f(x) = \left(\frac{1}{4}\right)^{x-2} - 1$$

$$191) f(x) = \left(\frac{1}{4}\right)^{x-2} - 2$$

$$192) f(x) = 3^{x-2} + 2$$

Identify the domain and range of each. Then sketch the graph.

$$193) f(x) = \ln(x + 3) - 4$$

$$194) f(x) = \ln(x + 1) - 1$$

Rewrite each series as a sum.

$$195) \sum_{a=1}^4 \frac{a^2 + 1}{a}$$

$$196) \sum_{a=5}^9 (2a^2 - 1)$$

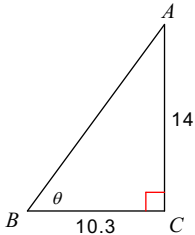
Evaluate each series.

$$197) \sum_{k=0}^5 (k + 400)$$

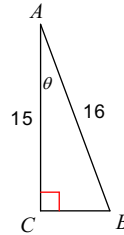
$$198) \sum_{k=4}^8 (400 - k)$$

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

199)

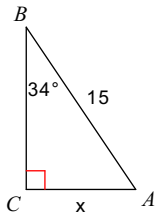


200)

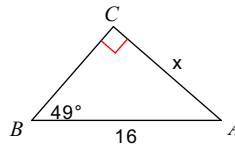


Find the measure of each side indicated. Round to the nearest tenth.

201)

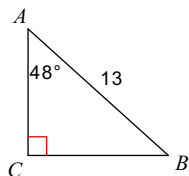


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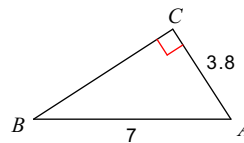


Solve each triangle. Round answers to the nearest tenth.

203)

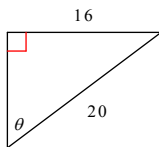


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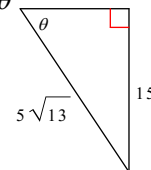


Find all six trig ratios (sin, cos, tan, csc, sec, cot)

205) $\sin \theta$



206) $\cot \theta$



In each problem, angle C is a right angle. Find the angle indicated to the nearest tenth.

207) Find $m\angle B$ if $a = 4.4$, $b = 3.4$

208) Find $m\angle A$ if $a = 9$, $b = 10$

209) Find $m\angle A$ if $a = 2$, $b = 5.4$

210) Find $m\angle B$ if $b = 4$, $a = 2.7$

Convert each degree measure into radians and each radian measure into degrees.

211) -225°

212) 340°

213) $\frac{5\pi}{4}$

214) $\frac{7\pi}{6}$

Find all six trig ratios given the coordinates

215) $\tan \theta; (-5, \sqrt{11})$

216) $\csc \theta; (-2, -2\sqrt{3})$

Solve each equation for $0 \leq \theta < 2\pi$.

217) $\cos \theta = -1$

218) $\frac{1}{2} = \sin \theta$

219) $2 = 2 - \frac{1}{2} \cdot \cos \theta$

220) $-6 = -2 + 4 \tan \theta$

221) $0 = -2 + 2 \tan \theta$

222) $1 + \frac{2}{5} \cdot \sin \theta = \frac{6}{5}$

223) $\sin \left(\theta + \frac{\pi}{6} \right) = \frac{\sqrt{2}}{2}$

224) $\sin 4\theta = \frac{1}{2}$

Graph each function using radians.

225) $y = 4 \sin 3\theta$

226) $y = 2 \cos \left(\theta + \frac{3\pi}{4} \right)$

227) $y = \tan \left(\theta + \frac{\pi}{2} \right) + 2$

228) $y = \csc 2\theta$

229) $y = \sec \frac{\theta}{2}$

230) $y = \cot \frac{\theta}{3}$

Sketch the graph of each linear inequality.

231) $y > \frac{2}{5}x + 5$

232) $y \geq \frac{5}{4}x + 2$

233) $x < 2$

234) $y > 2$

235) $7x + y \geq -3$

236) $3x - y < -1$

237) $5x + 4y \leq 4$

238) $x + 2y \leq 4$

Solve each system by elimination.

239) $-4x + 4y + 24 = 0$
 $-10y + 8 = 24x$

240) $0 = -21y - 42x + 42$
 $-7 + 7x = 10y$

241) $10y = 11 - 5x$
 $15x + 30y = 15$

242) $-14y = 16 - 4x$
 $18x - 42y = 30$

Solve each system by substitution.

243) $y = -3x - 4$
 $2x + 4y = 24$

244) $y = 6x + 18$
 $-6x + 7y = 18$