

## Analysis of Functions Summer Packet

Many topics that we will study next year in your mathematics class build on topics that you have already learned in previous classes. Since many of you have been away from these ideas for a long period of time, you might need a refresher in order to be up to speed at the beginning of the course. You are expected to know these concepts for Analysis of Functions. **Please work through the problems in this packet, showing all appropriate work on a separate sheet of paper. All work and answers not on a separate sheet of paper will not be graded and result in a zero. Please keep your work labeled and organized, in numerical order. Box all answers.** If you are unfamiliar with a term or type of problem, refer back to your notes, the examples provided or go online to various help sites for mathematics. The skills covered are part of the foundation for your course. Master of these skills is assumed. Have this work ready for the first day of class. **A calculator may only be used for problems #165-180.** This packet will be collected and you should expect to be tested on this review material. We look forward to working with you next year!

This packet will be collected on **Friday of the first week** for all regular classes, and on **Wednesday of the first week** for first semester block class.

Second semester block class: packets will be collected on **Friday of the first week.**

### Helpful Websites:

[www.algebra.com](http://www.algebra.com)

[www.gomath.com](http://www.gomath.com)

[www.algebrahelp.com](http://www.algebrahelp.com)

## Summer Packet

Date \_\_\_\_\_ Period \_\_\_\_\_

**Solve each inequality and graph its solution.**

1)  $-6 - 6(5x - 6) > -6(5 + 3x)$

2)  $7(p + 4) \geq 5(p + 6)$

3)  $2(-b - 2) \geq -4(b + 5)$

4)  $3n + 3(n - 8) < -2(6 - 2n)$

**Solve each equation.**

5)  $-8 \left| \frac{x}{4} \right| = -12$

6)  $\left| \frac{p}{10} \right| - 5 = -4$

7)  $-3|7 + 3n| + 10 = 4$

8)  $8|8m - 5| - 1 = 23$

**Solve each inequality and graph its solution.**

9)  $-8 + 3|8p| < 40$

10)  $4 + 3|k + 7| > 7$

11)  $3|-7x| + 8 < 50$

12)  $7 + 4|-3n| \geq 91$

**Evaluate each function.**

13)  $g(a) = |a|$ ; Find  $g(-6)$

14)  $g(x) = 5^x$ ; Find  $g(-2)$

15)  $g(a) = a^2 - 2$ ; Find  $g(2)$

16)  $f(x) = -2x^2 + 5x$ ; Find  $f(1)$

**Write the slope-intercept form of the equation of the line through the given points.**

17) through:  $(-3, 4)$  and  $(-3, -4)$

18) through:  $(0, -3)$  and  $(1, 3)$

19) through:  $(-4, -3)$  and  $(0, -2)$

20) through:  $(-5, -1)$  and  $(0, -4)$

**Write the slope-intercept form of the equation of each line.**

21)  $y - 2 = x - 2$

22)  $y - 5 = -\frac{7}{5}(x + 5)$

23)  $y + 2 = 3(x + 1)$

24)  $y - 4 = -\frac{3}{4}(x + 4)$

**Write the slope-intercept form of the equation of the line described.**

25) through:  $(1, -3)$ , parallel to  $y = -5x - 4$

26) through:  $(3, -4)$ , parallel to  $y = -\frac{7}{3}x - 2$

27) through:  $(-5, -1)$ , parallel to  $y = x - 5$

28) through:  $(4, 1)$ , parallel to  $y = -\frac{1}{4}x - 4$

29) through:  $(-1, 3)$ , perp. to  $y = -\frac{1}{2}x - 5$

30) through:  $(-3, -2)$ , perp. to  $y = x - 4$

31) through:  $(2, -4)$ , perp. to  $y = \frac{2}{9}x - 5$

32) through:  $(-1, 2)$ , perp. to  $y = \frac{1}{7}x + 5$

**Sketch the graph of each line.**

33)  $y = \frac{1}{2}x - 5$

34)  $y = -x - 4$

35)  $y = -\frac{1}{5}x - 1$

36)  $y = -x$

**Sketch the graph of each linear inequality.**

37)  $y \leq x + 2$

38)  $y < -\frac{1}{4}x + 5$

39)  $y > -\frac{4}{5}x + 4$

40)  $y \geq -\frac{3}{2}x - 4$

**Solve each system by elimination.**

41)  $-12x - 6y = 6$   
 $-4x - 4y = 16$

42)  $-x + 5y = 15$   
 $-6x - 8y = -24$

43)  $-2x - 14y = 30$   
 $-x - 7y = 15$

44)  $-27x - 18y = -18$   
 $18x + 12y = 12$

45)  $-50x - 60y = 0$   
 $-15x - 18y = 0$

46)  $30x + 18y = 12$   
 $-40x - 24y = 24$

47)  $-2x + 3y + 5z = -16$   
 $3x + 4y - z = 2$   
 $2x + 5y - 2z = 14$

48)  $-6a - 5b - 3c = -3$   
 $a - 2b + 5c = 0$   
 $4a + 5b - 4c = 9$

**Factor each completely.**

49)  $x^2 - 7x - 18$

50)  $4m^4 + 20m^3 - 96m^2$

51)  $2r^2 + 12r + 10$

52)  $3p^3 - 48p^2 + 180p$

53)  $a^3 - 3a^2 - 18a$

54)  $x^2 - 4x + 3$

55)  $x^3 + 3x^2$

56)  $p^3 - 12p^2 + 32p$

57)  $n^2 + 7n$

58)  $5r^3 + 40r^2 - 100r$

59)  $7x^2 - 50x + 48$

60)  $3n^2 + 7n - 20$

61)  $12m^2 - 126m + 60$

62)  $3b^2 - 7b - 6$

63)  $4x^2 + 34x + 60$

64)  $28m^3 + 116m^2 + 96m$

65)  $5v^2 + 34v - 48$

66)  $35n^2 - 80n + 45$

67)  $10n^2 - 15n$

68)  $27x^2 + 9x$

69)  $9x^3 - 18x^2 - 40x$

70)  $27n^3 + 210n^2 + 147n$

71)  $18m^2 + 87m + 90$

72)  $18n^2 - 90n + 112$

**Solve each equation by completing the square.**

73)  $m^2 + 12m - 14 = 0$

74)  $n^2 + 18n + 47 = 0$

75)  $r^2 - 12r - 45 = 0$

76)  $x^2 - 20x + 84 = 0$

77)  $5n^2 = 40 - 10n$

78)  $8b^2 = 10 + 16b$

**Solve each equation with the quadratic formula.**

79)  $3v^2 - 3v = -5v^2 + 15$

81)  $-19 = -10 + 4n^2$

83)  $4v^2 - 10v - 9 = 1$

80)  $12x^2 + 9 = -x + 8x^2$

82)  $8a^2 + 3a + 12 = 4$

84)  $-8x^2 - 15x + 2 = 8 - 5x$

**Simplify.**

85)  $\sqrt{150m^2}$

87)  $\sqrt{150x^3}$

89)  $\sqrt{96b^4}$

91)  $3\sqrt{8} + 3\sqrt{27} + 2\sqrt{2}$

93)  $3\sqrt{3} - 3\sqrt{24} + 3\sqrt{3}$

95)  $-3\sqrt{45} + 2\sqrt{18} + 3\sqrt{5}$

97)  $3\sqrt{5}(5 + \sqrt{5})$

99)  $\sqrt{15}(4 + \sqrt{10})$

101)  $\frac{3 + \sqrt{5}}{2 - 5\sqrt{5}}$

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

105)  $(-6i) - (8 + 4i) - (-3 + 8i)$

107)  $(-8 + 7i) + (3 - 6i) + (-6 + 5i)$

109)  $(-7 - 8i) - (-8 - 2i) + (6 - 3i)$

111)  $(6 + 3i)(-1 - 4i)$

113)  $(-6 - 8i)(-2 + 6i)$

115)  $(-5 - 6i)^2$

117)  $\frac{5 - 10i}{9 + 4i}$

119)  $\frac{4 - 3i}{-5 + 10i}$

121)  $\frac{4 - 3i}{1 - 5i}$

86)  $\sqrt{50r^2}$

88)  $\sqrt{48n^3}$

90)  $\sqrt{27v^4}$

92)  $-2\sqrt{20} + 2\sqrt{45} + 2\sqrt{45}$

94)  $-\sqrt{12} - \sqrt{3} - \sqrt{3}$

96)  $2\sqrt{54} + 3\sqrt{18} - 3\sqrt{6}$

98)  $\sqrt{10}(\sqrt{2} + 2\sqrt{10})$

100)  $\sqrt{5}(-3\sqrt{10} + 2)$

102)  $\frac{4 + \sqrt{5}}{2 - 2\sqrt{3}}$

104)  $\frac{-5 + 5\sqrt{5}}{-3 + 3\sqrt{3}}$

106)  $(-7 - i) - (-7 - i) - (5 - 4i)$

108)  $(1 + 3i) - (2 - 4i) - (2i)$

110)  $(2 + 6i) - (8 - i) + (-5 - 3i)$

112)  $(-6 - 8i)^2$

114)  $(-4 + 3i)^2$

116)  $(6 + 2i)(-8 - 8i)$

118)  $\frac{-10 + 8i}{-8 - 7i}$

120)  $\frac{-10 + 8i}{-2 + 7i}$

122)  $\frac{10 - 6i}{5 - 9i}$

**Name each polynomial by degree and number of terms.**

123)  $-3$

125)  $x + 2x^3$

127)  $2n^3 + 6n$

124)  $-8x^4$

126)  $-10$

128)  $-9x^3 - 6 + 9x^6$

**Evaluate each function at the given value.**

129)  $f(x) = x^3 + 5x^2 + 5x + 13$  at  $x = -5$

130)  $f(a) = a^3 - 2a^2 - 2a + 13$  at  $a = 2$

131)  $f(m) = -6m^4 + 27m^3 + 9m^2 + 28m - 1$  at  $m = 5$

132)  $f(a) = a^3 - a^2 - 7a - 1$  at  $a = 3$

134)  $f(a) = 3a^4 + 16a^3 + 2a^2 - 19a - 9$  at  $a = -5$

133)  $f(a) = 4a^3 + 12a^2 - 21a - 25$  at  $a = -4$

**Divide using synthetic division.**

135)  $(n^3 - 10n^2 + 28n - 15) \div (n - 3)$

137)  $(5b^3 - 45b^2 - 56b + 67) \div (b - 10)$

139)  $(x^3 - 2x^2 - 38x + 54) \div (x + 6)$

141)  $(5a^3 - a^2 + 6a - 7) \div (a - 1)$

143)  $(6x^3 - 23x^2 + 6x - 31) \div (x - 4)$

136)  $(x^3 - 13x^2 + 39x - 23) \div (x - 9)$

138)  $(v^3 - 10v^2 + 11v + 36) \div (v - 3)$

140)  $(x^3 + 9x^2 + 9x - 63) \div (x + 6)$

142)  $(k^3 - 8k^2 + 19k - 14) \div (k - 2)$

144)  $(p^3 + 7p^2 - 12p + 1) \div (p - 1)$

**Perform the indicated operation.**

145)  $g(x) = 2x + 2$   
 $h(x) = x^2 + 2$   
Find  $(g + h)(-9)$

147)  $f(x) = x + 5$   
 $g(x) = x - 5$   
Find  $\left(\frac{f}{g}\right)(9)$

149)  $g(x) = x^2 + x$   
 $f(x) = 2x + 4$   
Find  $(g - f)(-6)$

151)  $f(a) = a^3 - 2$   
 $g(a) = 4a - 2$   
Find  $\left(\frac{f}{g}\right)(-2)$

153)  $g(t) = 3t - 4$   
 $f(t) = t^2 - 1$   
Find  $(g \cdot f)(2)$

155)  $g(n) = -2n + 4$   
 $h(n) = 3n^3 - 3$   
Find  $g(h(3))$

157)  $g(n) = 4n - 5$   
 $f(n) = n^2 + 4n$   
Find  $g(f(-9))$

159)  $f(t) = 2t + 5$   
 $g(t) = t^2 + 4t$   
Find  $f(g(-8))$

161)  $h(x) = 3x - 1$   
Find  $h(h(6))$

163)  $g(x) = x + 4$   
 $h(x) = -3x + 4$   
Find  $g(h(-3))$

146)  $g(x) = -x + 1$   
 $h(x) = 3x^2 + 4x$   
Find  $(g + h)(3)$

148)  $h(n) = 3n + 2$   
 $g(n) = n^3 + 2n^2$   
Find  $\left(\frac{h}{g}\right)(-4)$

150)  $g(t) = 2t^2 - 3$   
 $f(t) = 2t - 5$   
Find  $(g - f)(-4)$

152)  $f(x) = x - 5$   
 $g(x) = x + 4$   
Find  $(f + g)(6)$

154)  $f(x) = -2x - 1$   
 $g(x) = x^2 - 3x$   
Find  $(f \cdot g)(-3)$

156)  $h(n) = 4n - 1$   
 $g(n) = n^3 + 5n^2$   
Find  $h(g(-5))$

158)  $h(t) = 3t + 2$   
 $g(t) = 3t$   
Find  $h(g(7))$

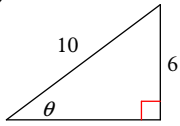
160)  $h(x) = 3x - 5$   
 $g(x) = x^2 + 2$   
Find  $h(g(2))$

162)  $h(n) = 4n + 5$   
 $g(n) = 3n - 2$   
Find  $h(g(-9))$

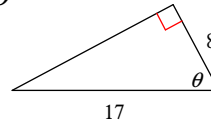
164)  $g(t) = -4t - 5$   
 $h(t) = 2t - 3$   
Find  $g(h(10))$

Find the value of the trig function indicated.

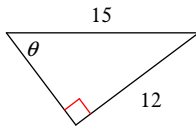
165)  $\cot \theta$



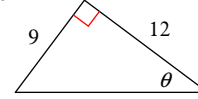
166)  $\sin \theta$



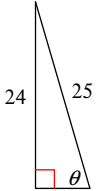
167)  $\tan \theta$



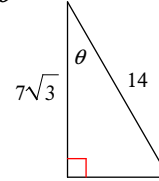
168)  $\csc \theta$



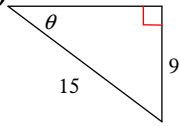
169)  $\sin \theta$



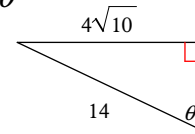
170)  $\csc \theta$



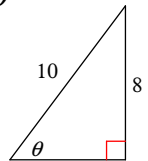
171)  $\sec \theta$



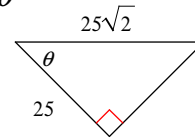
172)  $\cos \theta$



173)  $\cos \theta$

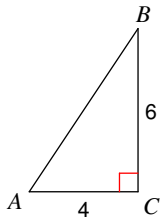


174)  $\sec \theta$

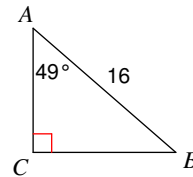


Solve each triangle. Round answers to the nearest tenth.

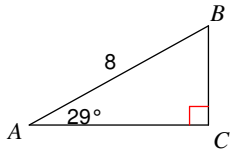
175)



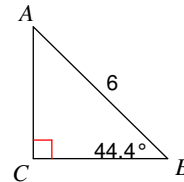
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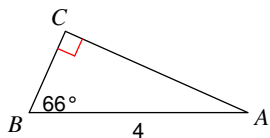
177)



178)



179)



180)

