

# **Analysis of Functions/Trigonometry Pre-Calculus 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.

**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. Do Not write on this packet. 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 to your notes 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. We look forward to working with you next year!

**Have this packet ready for the first day of class.** This packet will be collected and graded based on the problems you have completed with appropriate work.

## Helpful Websites:

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

[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 equation.**

1)  $4 - |-5 + 7v| = -15$

2)  $5|2x - 2| + 3 = 23$

3)  $8 - 3|-9b + 7| = 2$

4)  $-8|-2x + 7| + 1 = -23$

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

5)  $4|2 + 7x| + 7 \leq 83$

6)  $8|6 + 7n| + 7 \leq 55$

7)  $10 + 3|-2v + 8| \geq 22$

8)  $1 + 9|4a + 7| < 100$

**Evaluate each function.**

9)  $g(n) = 2 \cdot 5^{-n-1}$ ; Find  $g(2)$

10)  $w(x) = x^2 + 2x$ ; Find  $w(-1)$

11)  $f(x) = |-2x + 1|$ ; Find  $f(-5)$

12)  $h(x) = -x + 1$ ; Find  $h(-9)$

13)  $g(t) = |3t| - 1$ ; Find  $g(6)$

14)  $k(n) = n^3$ ; Find  $k(-3)$

**Simplify.**

15)  $6\sqrt[3]{375v^8}$

16)  $6\sqrt[3]{16x^7y^6}$

17)  $-3\sqrt{32}$

18)  $8\sqrt{448}$

19)  $2\sqrt{3} + 3\sqrt{20} - 2\sqrt{20}$

20)  $-3\sqrt{3} + 3\sqrt{12} - 2\sqrt{27}$

21)  $\sqrt{3}(-2\sqrt{6} + \sqrt{10})$

22)  $-3\sqrt{15}(\sqrt{3} + 5)$

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

24)  $(5\sqrt{5} + \sqrt{3})(3\sqrt{4} + \sqrt{3})$

25)  $(\sqrt{3} + \sqrt{2})(\sqrt{2} + 2\sqrt{2})$

26)  $(\sqrt{3} - \sqrt{2})(-4\sqrt{3} + \sqrt{2})$

**Write each expression in exponential form.**

$$27) \frac{1}{(\sqrt[3]{7x})^5}$$

$$28) \frac{1}{\sqrt{7n}}$$

$$29) (\sqrt[4]{r})^7$$

$$30) \frac{1}{(\sqrt[3]{4b})^2}$$

**Write each expression in radical form.**

$$31) (5b)^{\frac{5}{3}}$$

$$32) (3v)^{\frac{3}{4}}$$

$$33) x^{\frac{1}{2}}$$

$$34) x^{-\frac{5}{3}}$$

**Simplify.**

$$35) \frac{\sqrt{20}}{3\sqrt{16}}$$

$$36) \frac{\sqrt{15}}{2\sqrt{5}}$$

$$37) \frac{4 - \sqrt{3}}{3\sqrt{16}}$$

$$38) \frac{2 - 4\sqrt{3}}{\sqrt{16}}$$

$$39) \frac{\sqrt{5} - 4\sqrt{2}}{-1 - 5\sqrt{5}}$$

$$40) \frac{3 + \sqrt{3}}{-1 - \sqrt{5}}$$

$$41) \frac{\sqrt{3} + 4\sqrt{2}}{3 + \sqrt{3}}$$

$$42) \frac{\sqrt{5} - 2\sqrt{2}}{2\sqrt{3} - \sqrt{5}}$$

$$43) \frac{\sqrt[3]{4}}{3\sqrt[3]{27}}$$

$$44) \frac{2\sqrt[3]{15}}{\sqrt[3]{-64}}$$

$$45) \frac{\sqrt[3]{20}}{\sqrt[3]{256}}$$

$$46) \frac{4\sqrt[3]{2}}{2\sqrt[3]{250}}$$

**Find each product.**

47)  $(3n - 6)(5n + 4)$

48)  $(6p - 8)(3p + 2)$

49)  $(4m + 3)(5m + 6)$

50)  $(7x - 8)(4x + 5)$

51)  $(6r - 1)(6r^2 + 4r + 6)$

52)  $(5b + 8)(6b^2 - 4b + 4)$

53)  $(4n^2 - n + 7)(8n^2 + 3n - 1)$

54)  $(2x^2 + x - 1)(8x^2 + 3x - 2)$

**Divide.**

55)  $(v^3 - 4v^2 - 1) \div (v - 4)$

56)  $(x^3 + 3x^2 - 26x - 43) \div (x + 6)$

57)  $(x^3 + 12x^2 + 25x + 4) \div (x + 3)$

58)  $(7b^3 + 34b^2 - 38b + 55) \div (b + 6)$

**Factor each.**

59)  $x^3 + 2x^2 - 3x - 6 = 0$

60)  $x^3 + x^2 + x + 1 = 0$

61)  $x^2 + 5x + 6 = 0$

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

**Factor each completely.**

63)  $16r^2 + 40r + 25$

64)  $16n^2 - 25$

65)  $9b^2 - 4$

66)  $9x^2 - 30x + 25$

67)  $16m^2 - 1$

68)  $4x^2 - 12x + 9$

69)  $15b^3 - 65b^2 + 50b$

70)  $-2k^2 + 17k - 35$

71)  $5v^2 + 4v$

72)  $3m^2 + 13m + 14$

73)  $-25x^2 - 5x$

74)  $7n^3 + 24n^2 - 16n$

**Simplify. Your answer should contain only positive exponents.**

75)  $a^2 \cdot 2b^3$

76)  $2x^2y^{-1} \cdot x^4y^2$

77)  $x^{-1}y^{-4} \cdot 2y^2$

78)  $4u^{-2}v^2 \cdot u^3v^4 \cdot u^{-4}v^{-1}$

79)  $(m^3n^{-1})^0 \cdot 2m^0n^2$

80)  $(2y^4)^{-4} \cdot (x^{-2}y^2)^4$

81)  $(2a^3b^3)^{-2} \cdot (2a^4b^{-3})^2$

82)  $x^2y^0 \cdot (2y^4)^0$

83)  $\frac{2u^{-3}v^{-3} \cdot (2v^2)^3}{(uv^4)^{-4}}$

84)  $\frac{a \cdot a^4b^0}{(a^0)^3}$

85)  $\frac{x^{-1}y^3}{y^{-3}}$

86)  $\frac{x^0y^0}{4x^3y^{-4}}$

**Simplify each and state the excluded values.**

87)  $\frac{20p + 100}{20p - 60}$

88)  $\frac{k^2 - 5k + 6}{6k^2 - 12k}$

89)  $\frac{n^2 + 5n + 4}{n^2 - 16}$

90)  $\frac{24x^2 + 24x}{40x^2 - 56x}$

91)  $\frac{8a^3 - 96a^2 + 160a}{2a^3 - 14a^2 - 60a}$

92)  $\frac{2x^2 + 6x - 140}{x^3 - 9x^2 + 14x}$

93)  $\frac{10n^2}{n^2 + 3n - 10} \div \frac{10n^3 + 90n^2}{3n - 6}$

94)  $\frac{18 - 3x - x^2}{8x^3 - 80x^2} \cdot \frac{100 - x^2}{x^2 + 7x - 30}$

**Simplify each expression.**

95)  $\frac{b - 5}{10b^2 - 12b} - \frac{2b - 4}{10b^2 - 12b}$

96)  $\frac{2r + 6}{3r - 6} + \frac{5}{3r - 6}$

$$97) \frac{6}{x+6} - \frac{4}{2x-5}$$

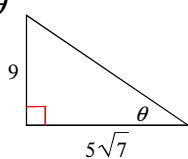
$$98) \frac{5}{3k} + \frac{k-5}{3k^2+6k}$$

$$99) \frac{\frac{2}{3} + \frac{4}{a}}{2}$$

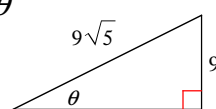
$$100) \frac{\frac{2}{x^2} + \frac{1}{4}}{\frac{x}{3} + \frac{1}{4}}$$

Find the value of the trig function indicated.

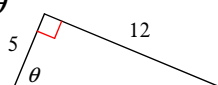
101)  $\cos \theta$



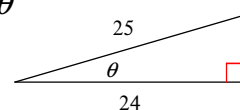
102)  $\cot \theta$



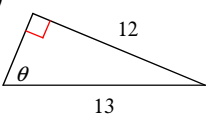
103)  $\cos \theta$



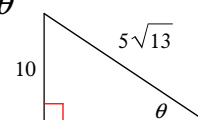
104)  $\sec \theta$



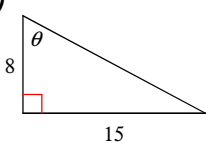
105)  $\sin \theta$



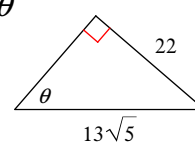
106)  $\csc \theta$



107)  $\tan \theta$

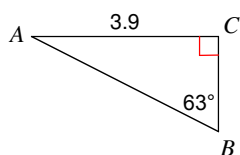


108)  $\sec \theta$

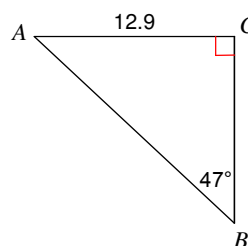


Solve each triangle. Round answers to the nearest tenth.

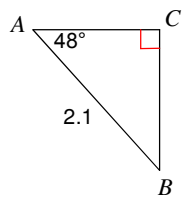
109)



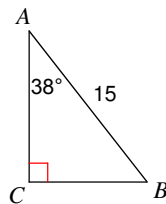
110)



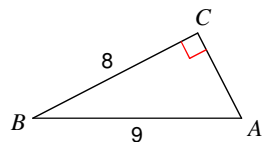
111)



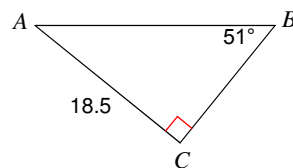
112)



113)



114)



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

115)  $660^\circ$ 116)  $-\pi$ 117)  $295^\circ$ 118)  $-\frac{\pi}{12}$ 119)  $150^\circ$ 120)  $\frac{31\pi}{18}$ 

**Find a positive and a negative coterminal angle for each given angle.**

121)  $-210^\circ$ 122)  $-150^\circ$ 123)  $175^\circ$ 124)  $-24^\circ$ 125)  $-70^\circ$