

Precalculus for BC – Summer Packet

Due Date: September 4th 2020.

DO ALL YOUR WORK ON A SEPARATE SHEET OF PAPER

Show all work to receive full credit for the assignment.

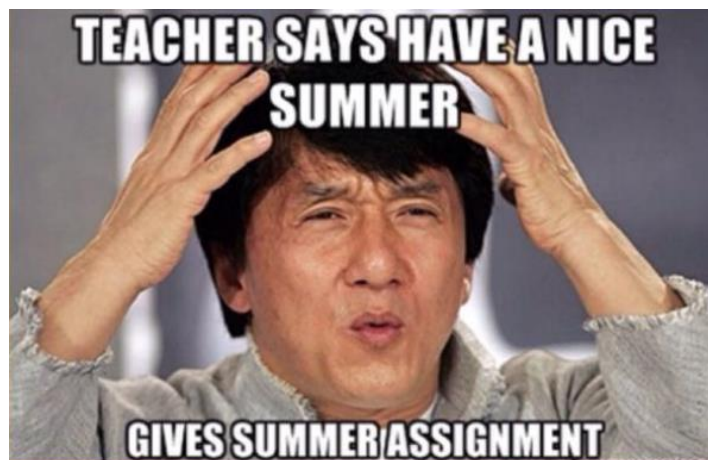
Welcome to Precalculus for BC! I look forward to guiding you through an informative and exciting year en route to Calculus! In order to be prepared for the rigor of this course, you must complete the attached assignment.

Please complete this assignment on a separate sheet of paper and bring it with you the first day of class. There will be a short amount of time to ask questions during the first class. You must **SHOW ALL WORK** on all problems. Calculators are **NOT** allowed on this assignment except to find trig values of non-special right triangles.

THE MATERIAL INCLUDED IN THIS REVIEW ASSIGNMENT IS ESSENTIAL FOR UNDERSTANDING FUNDAMENTAL CONCEPTS OF TRIGONOMETRY AND PRECALCULUS. Please understand that strategies presented in this review will be utilized extensively throughout the curriculum. It is recommended that each student has a graphing calculator (TI-83, TI-83 plus, TI-84 or TI84 plus) of his/her own. Please use your notes from previous years, the internet, work with other students or email me at handalsx@pwcs.edu if you have any questions.

This packet is designed to keep your math skills from deteriorating from lack of use. One thing is for sure – the more you do over the summer, the easier it will be when school starts and the more comfortable you will feel with the pace of the class. I will collect this packet and you will have a quiz on the packet.

I look forward to meeting you. Please contact me if you have any questions.



- Mrs. Handalagere
handalsx@pwcs.edu

Simplify the following exponents: **(KNOW YOUR EXPONENTS RULES)**

1. $(-2xz^5)(-3x)^2$ _____

2. $\left(\frac{x^3}{-2x^{-2}}\right)^3$ _____

3. $\left(\frac{3x^5y^6z^3}{6x^7y^2}\right)^2$ _____

4. $(-4x^6y^5) \cdot (3x^2y^3)$ _____

5. $\left(\frac{3}{4}\right)^{-2}$ _____

6. $\left(\frac{2x^5}{6x^4}\right)^{-3}$ _____

FUNCTIONS

Let $f(x) = 2x^2 - 1$ and $g(x) = 4x - 1$.

7. $(f - g)x$ _____

8. $\frac{f}{g}(x)$ _____

Do not forget restriction

9. $f(g(x))$ _____

10. $g \circ f$ _____

11. $(fg)x$ _____

12. $f^{-1}(x)$ _____

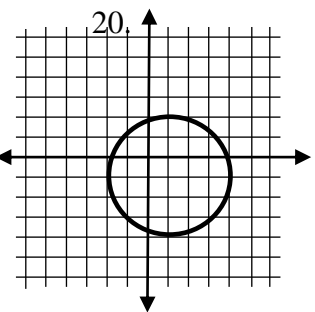
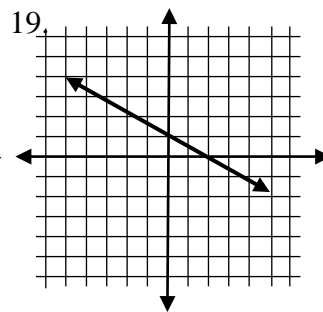
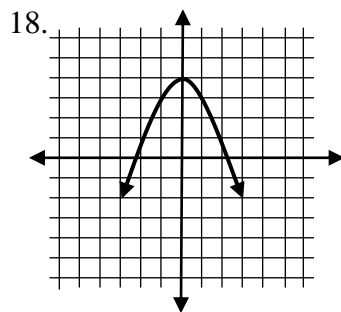
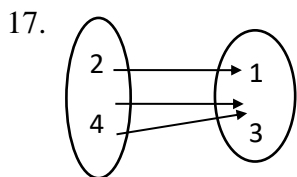
13. $(f \circ g)(1)$ _____

14. $g(f(-3))$ _____

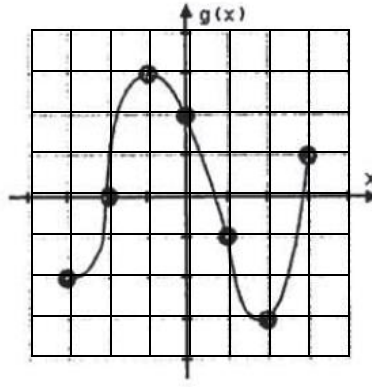
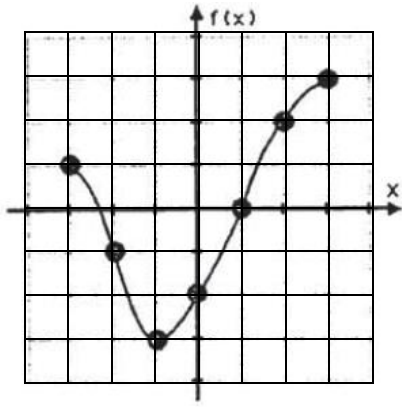
15. $f(5)$ _____

16. $g(x+1)$ _____

State the domain and range of the following graphs. Write the answer in both interval and set notation. Determine if the given graph is a function.



Composing from graphs and tables



21. $g(f(-3)) =$ _____ 22. $f(g(3)) =$ _____ 23. $g(f(0)) =$ _____

Use the table below to answer questions

x	1	2	3	4	5
$f(x)$	1	3	5	7	9

x	1	3	0	9	11
$g(x)$	0	2	-1	8	10

24. $g(f(5)) =$ _____ 25. $g \circ g(1) =$ _____ 26. $f \circ g(3) =$ _____

Describe the transformation on the following and graph them

27. $y = (x-1)^2 + 2$

Translation: _____

Reflection: _____

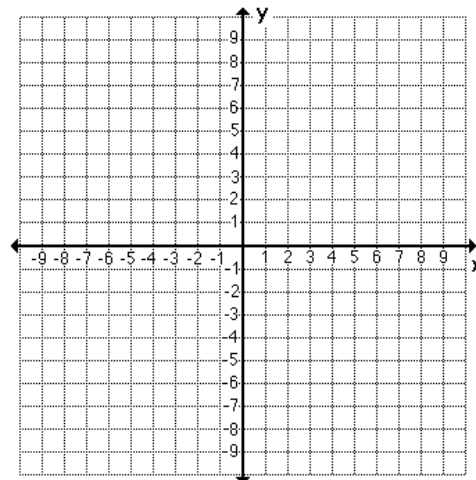
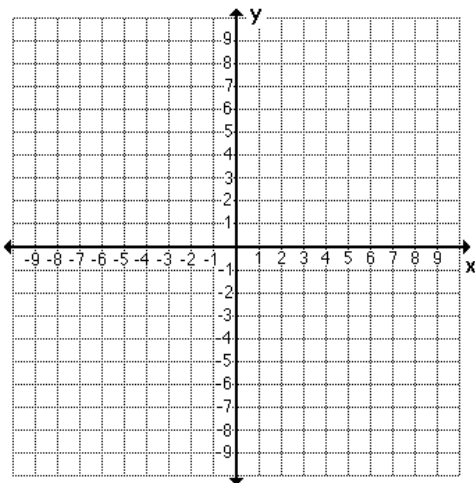
Dilation: _____

28. $y = \sqrt{-x-5} - 4$

Translation: _____

Reflection: _____

Dilation: _____



Radicals and Complex Numbers

29. $\sqrt[5]{64x^{10}y^{12}z}$ _____

30. $\sqrt{\frac{50x^4y^{17}z^3}{2x^5y^3}}$ _____

31. $\frac{2-\sqrt{3}}{1+\sqrt{2}}$ _____

32. $3x^2\sqrt{7} + \sqrt{28x^4} - \sqrt{63x^4}$ _____

33. $(4-\sqrt{5})(8+\sqrt{5})$ _____

34. $-2\sqrt{8x^4y^5z^9}$ _____

Express as Rational Exponent

35. $\sqrt[3]{250a^2b^{14}c^{29}}$ _____

Express as a Radical

36. $3x^2y^{\frac{1}{2}}z^{\frac{1}{3}}$ _____

Simplify the following

37. $(7+4i)(11+5i)$ _____

38. $(5-\sqrt{-2})^2$ _____

39. $\frac{4+i}{7-5i}$ _____

40. $\frac{5-2i}{6i}$ _____

41. $\frac{-4}{1-3i}$ _____

42. $2i^{53}$ _____

QUADRATICS

Solve each simple quadratic.

43. $2(x+1)^2 = 16$ _____

44. $(3x-1)^2 + 4 = 20$ _____

45. $16x^2 - 5 = 11x^2 + 12$ _____

46. $4 - 2(x+4)^2 = -68$ _____

Solve each quadratic by factoring.

47. $6x^2 - 12x - 18 = 0$ _____

48. $7x^2 - 14x = -7$ _____

49. $5x^2 - 44x + 120 = -30 + 11x$ _____

50. $6x^2 - 13x + 3 = -3$ _____

Solve each quadratic by using the quadratic formula.

51. $4x^2 + 11x - 20 = 0$ _____ 52. $x^2 = 2x + 48$ _____

Use completing the square to solve each quadratic.

53. $x^2 - 8x + 5 = 0$ _____ 54. $-3x^2 - 18x - 35 = 0$ _____

55. $5x^2 + 20x + 32 = 0$ _____ 56. $4x^2 + 8x - 9 = 0$ _____

Use the given information to write a quadratic in vertex form.

57. $2x^2 + 20x + 47 = y$ _____ 58. $\frac{1}{4}x^2 + 2x + 7 = y$ _____

Use the given information to write a quadratic in standard form.

59. $x = -\frac{1}{2}$ $x = 0$ _____ 60. $x = \frac{4}{3}$ $x = -\frac{2}{3}$ _____

RATIONALS (DON'T FORGET RESTRICTIONS)

61. $\frac{4x^2 - 8x - 12}{16x^2 - 144}$ _____ 62. $\frac{x^2}{6-x} \cdot \frac{x^2 + 2x - 48}{x^4 + 8x^3}$ _____

63. $\frac{x^2 - 49}{x + 7} \div \frac{(x - 7)}{3}$ _____ 64. $\frac{\frac{x-2}{x} + \frac{2}{x+1}}{\frac{3}{x-1} - \frac{1}{x+1}}$ _____

65. $\frac{\frac{x^2 + 8x + 15}{x^2 - 9}}{\frac{x^3 + 6x^2}{x^2 - 3x}}$ _____ 66. $\frac{4x}{x^2 + 5x + 6} + \frac{2}{4x + 8}$ _____

67. $\frac{x-9}{x^2 + 5x + 6} - \frac{7}{x+3}$ _____ 68. $\frac{-4x+9}{x^2-16} - \frac{-5x+5}{x^2-16}$ _____

Solve the following.

69. $\frac{4}{x^2 - 8x + 12} = \frac{x}{x-2} + \frac{1}{x-6}$ _____ 70. $1 - \frac{8}{x-5} = \frac{3}{x}$ _____

71. Identify the domain, range, and zeros.

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

Domain: _____

Range: _____

Zeros _____

Vertical asym. _____

Horizontal asym. _____

Holes: _____

72. Identify all asymptotes, etc.,

sketch a graph, including asymptotes.

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

Vertical asym. _____

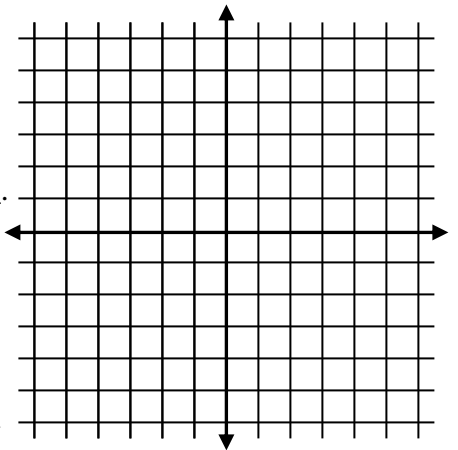
Horizontal asym. _____

Domain _____

Range _____

Zeros _____

Holes: _____



BEHAVIOR OF POLYNOMIAL GRAPHS

Answer the questions about the polynomial expression given.

73. $f(x) = -4x^3 + x^5 + 2$

Max turns: _____

End behavior:

Degree: _____ # of Roots: _____

74. $y = -x^8 + x^2$

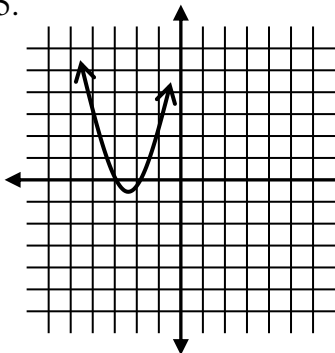
Max turns: _____

End behavior:

Degree: _____ # of Roots: _____

State whether the function has a positive or negative lead coefficient, whether the function has an even or odd degree, and the end behavior.

75.

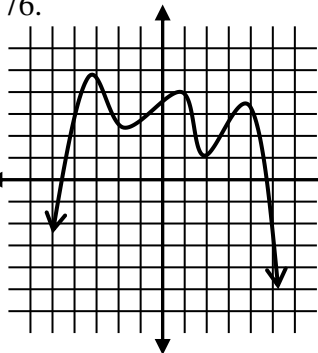


Sign LC _____

Degree : Even/Odd

End Behavior

76.

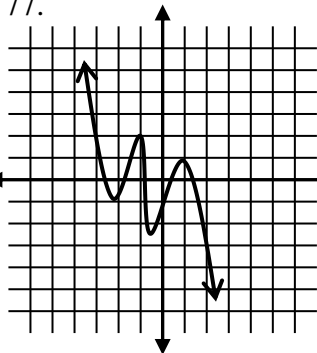


Sign LC _____

Degree : Even/Odd

End Behavior

77.

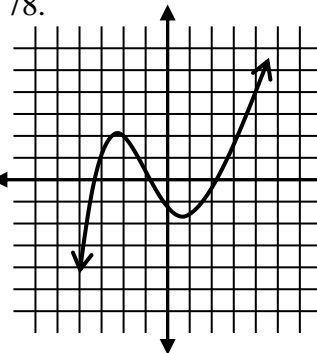


Sign LC _____

Degree : Even/Odd

End Behavior

78.



Sign LC _____

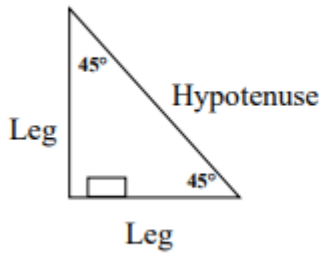
Degree : Even/Odd

End Behavior

GEOMETRY

Special Right Triangles

45°–45°–90° Triangles

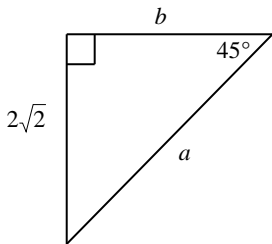


The ratio of leg-leg-hypotenuse is $1:1:\sqrt{2}$

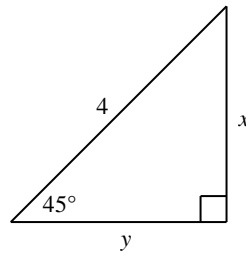
Hypotenuse = Leg $\cdot \sqrt{2}$

Find the missing variable. Leave your answers as simplified radicals.

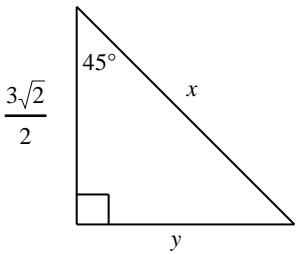
79. $a =$ _____ $b =$ _____



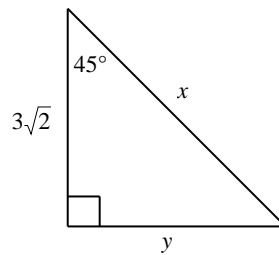
80. $x =$ _____ $y =$ _____



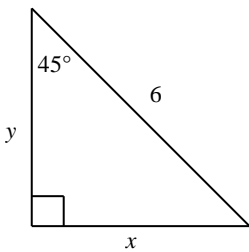
81. $x =$ _____ $y =$ _____



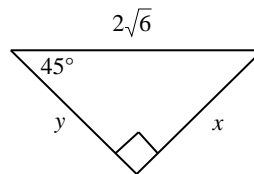
82. $x =$ _____ $y =$ _____



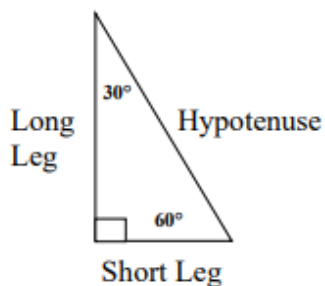
83. $x =$ _____ $y =$ _____



84. $x =$ _____ $y =$ _____



30°-60°-90° Triangles

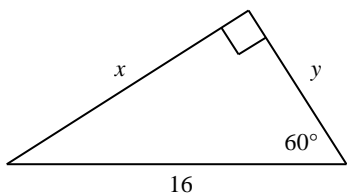


The ratio of short leg-long leg-hypotenuse is $1 : \sqrt{3} : 2$

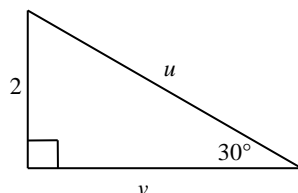
Hypotenuse = Twice the Short Leg

Long Leg = Short Leg $\cdot \sqrt{3}$

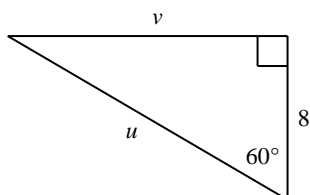
85. $x =$ _____ $y =$ _____



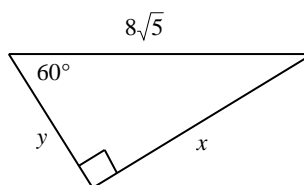
86. $u =$ _____ $v =$ _____



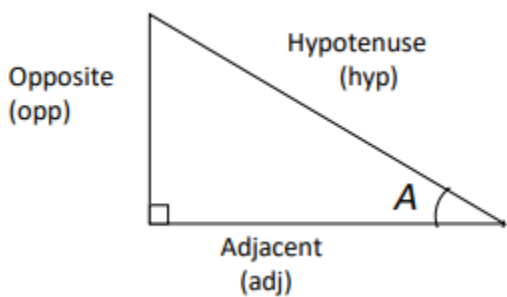
87. $u =$ _____ $v =$ _____



88. $x =$ _____ $y =$ _____



REMEMBER SOHCAHTOA: BASIC TRIGONOMETRY REVIEW



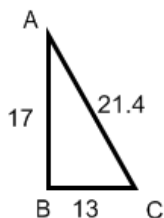
$\sin A = \frac{opp}{hyp}$

$\cos A = \frac{adj}{hyp}$

$\tan A = \frac{opp}{adj}$

Find the indicated trigonometric ratios as a fraction and as a decimal. Round it to the nearest ten-thousandths (0.0000)

Fig 1

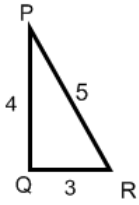


89. $\sin(A)$

90. $\cos(A)$

91. $\tan(A)$

Find the angle of the given ratio.



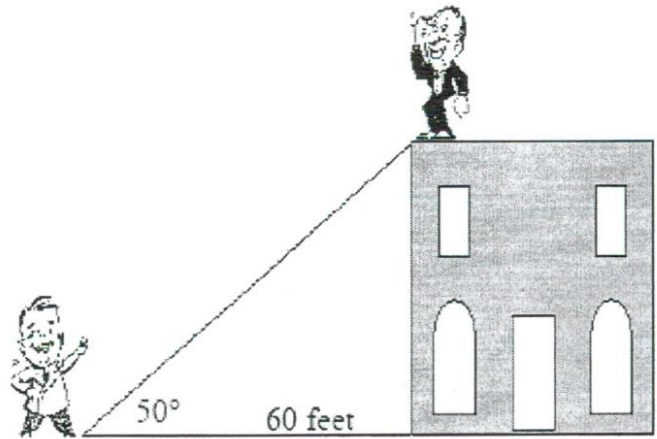
92. $\cos(\underline{\hspace{1cm}}) = \frac{4}{5}$

93. $\sin(\underline{\hspace{1cm}}) = \frac{3}{5}$

94. $\tan(\underline{\hspace{1cm}}) = \frac{4}{3}$

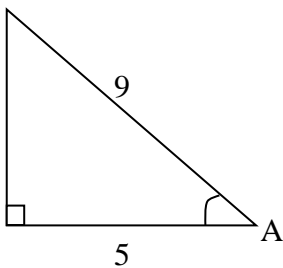
95. Joey went into Washington, D.C. for the President's Inauguration. Looking around, he was interested to see a man standing atop an office building. He estimated his distance from the building to be about 60 feet and the angle of elevation to the top of the building to be about 50° . Pulling out his calculator, he approximated the height of the building. Which equation did he use?

- A. $\tan 50^\circ = \frac{60}{x}$
- B. $\sin 50^\circ = \frac{x}{60}$
- C. $\tan 50^\circ = \frac{x}{60}$
- D. $\cos 50^\circ = \frac{60}{x}$



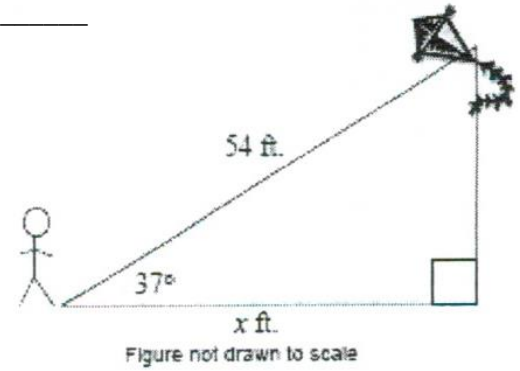
(Diagram not drawn to scale.)

96. Find the measure of angle A to the nearest degree.



97. A lighthouse keeper is located 150 feet above the water. He spots a boat way out on the water. The angle of depression is 5° . How far out on the water is the boat? (Round to the nearest whole meter)

98. The angle of elevation from John to the kite is 37° . The length of the string is 54 ft. Approximately how far is the ground distance (x) from John to the kite? _____



99. Did you do all of this packet in one night or did you do a few problems everyday over the summer.

100. Are you excited for Pre- Calc for BC.

-----WELCOME TO PRE-CALC FOR BC-----