2018 Summer Assignment

IB MYP Algebra 2/Trigonometry

Welcome to the summer assignment!

IB MYP Algebra 2/Trig is designed for advanced students who are capable of a more rigorous course at an accelerated pace. Students enrolled in this course are assumed to have mastery of the concepts in the Algebra 1 curriculum. A thorough treatment of advanced algebraic concepts is provided through the study of functions, polynomials, rational expressions, complex numbers, radical expressions, and sequences and series.

The summer assignment packet is good practice for this course to review the basics of Algebra. If you forgot how to solve problems, you can search the internet using Algebra Help and you can contact one of IB MYP Algebra 2/Trig teachers during the summer.

This assignment will count as an extra credit assignment for the first quarter if submitted on the first day of class. However, it will be graded for accuracy during the 2nd week of September.

Have a great summer!

Ms. Kim: kimms@pwcs.edu
Do all your work on this paper. **Answers without work = no credit!** Keep your work neat and legible. Mark your answers clearly. REMEMBER…when you come to school in the fall, you should be able to successfully work problems of the type represented here. Need help? With 2,400+ students at SJHS, there is someone down the street who can help or someone who knows a student in upper level math who can help. Sometimes, it just takes asking. Also, there are a number of excellent homework help sites on the internet. Just search for **Homework Help in Algebra II.**

**PART 1**

Simplify:

1. \(8 - 4 \div 2 - 1\)
2. \(3(x - 8) - 2(x + 5)\)
3. \(6 - 4 \div 12 + 8 \div 6\)

Evaluate the expression

4. \(-3x^2 + 4x\) when \(x = -2\)
5. \(\frac{-2(y + 1)}{16 - 2y^2}\) when \(y = 4\)
6. \(-2b^2 + 4ab\) when \(a = 3, b = -1\)

Solve these equations and inequalities. Be sure to show your work.

7. \(-2(4t - 7) = 3(t - 10)\)
8. \(7 = 7(2b + 5) - 6(b + 8)\)

9. \(-4x - 4 = 3(2 - x)\)
10. \(2a - 6 - (3a + 4) = 10 - 4a\)

For #11-13- Solve. Graph the solution to the inequality on a number line.

11. \(-3 \leq 2x - 1 \leq 5\)
12. \(3x + 1 < -2\) or \(3x + 1 > 7\)
13. \[3x - 2 \leq 5x - 3\]  
14. \[7 \geq 2 - 5y \geq -3\]

Literal Equations. Solve for the indicated variable.

15. Solve for \(h\): \[V = \pi r^2 h\]  
16. Solve for \(w\): \[P = 2l + 2w\]

17. Solve for \(P\): \[A = P + Prt\]  
18. Solve for \(y\): \[5xy + 2x = 3\]

Application:

19. From 1980 through 1990, the prize money, \(P\) (in $1000's) for the singles champions at the U.S. Tennis Open can be modeled by \(P = 30.2t + 35.8\) where \(t = 0\) represents 1980. According to this model, when will the prize money be $500,000?

**PART 2**

20. Construct a table of values for \(y = -4x + 12\) if \(x \in \{-3, -2, -1, 0, 1, 2, 3\}\)

21. A business had a profit of $58,000 in 1989 and a profit of $74,000 in 1993. Find the rate of change. Write an equation that models the information given.

Rate of change ______________  
Equation ___________________
Find the slope of the line containing the points and write an equation of the line containing the points:

22. (9,1), (-5,2)  
23. (6,5), (-2,5)  
24. (2,5), (4,8)  
25. (6,3), (6,-1)

slope:  
slope:  
slope:  
slope:

equation:  
equation:  
equation:  
equation:

State whether the lines are parallel, perpendicular or neither. Explain why.

26. 2x - 4y = 8, -x + 2y = 4  
27. 2x - 4y = 8, 2x + y = 4

Find the x and y intercepts of the given lines.

28. 2x - 5y = 20  
29. -9y - 12x = 27

Write each equation in slope-intercept form.

30. 2x - 10y = 15  
31. x - y = 2x + 3y + 9  
32. -2x = 24 - 8y

33. Write the equation of the line with y-intercept 4 and slope -3.

34. Write the equation of the line with slope 2 and containing the point (-4,5)

35. Write the equation of the line containing (5,-2) and (7,-3) that is parallel to 2x + y = 6
36. Write the equation of the line that passes through (6, 4) and is
a. parallel to \( y = 2x - 5 \)

b. perpendicular to \( y = 2x - 5 \)

37. If \( x \) and \( y \) vary directly, find the equation that relates the two variables if (Hint: \( y = kx \))
a. \( y = 10 \) when \( x = 1 \) 
b. \( y = 4 \) when \( x = 6 \)

c. The distance a spring will stretch \( d \) varies directly with the force (or weight) \( F \) attached to the spring. If a spring stretches 2.5 inches when 50 pounds is attached, how far will it stretch with 70 pounds is attached?

Graph the following equations and inequalities

38. \( 2x - 3y = 12 \) 

39. \( y = 5 \) 

40. \( y < 2x + 1 \)
41. \( y = -\frac{2}{3}x - 4 \)

42. \( x \geq -2 \)

43. \( y = -3x \)

44. \( 3x - 2y > 4 \)
PART 3
Other areas of general knowledge. For each of the following, use resources from the internet or local library to help you give answers.

45. You should know basic vocabulary of numbers. This includes the meaning/difference between whole numbers, natural numbers, integers, rational numbers, real numbers and irrational numbers. Define each and give several examples of numbers that would belong to each set. You should be able to easily compare, and identify a listing of numbers that represents each type of number listed above.

For each value given below, identify which set/s (from the bolded sets above) that each value would belong.

\[ 22 \quad \sqrt{3} \quad 2.27 \quad 0 \quad -2.3333 \quad \frac{4}{3} \quad -2 \]

\[ \sqrt{4} \quad \sqrt{143} \quad 3.125 \]

46. Properties of addition and multiplication - Give an example of each of the following properties.
   a. Commutative Property for Addition and for Multiplication
   b. Associative Property for Addition and for Multiplication
   c. Identity Property for Addition and for Multiplication
   d. Inverse Property for Addition and for Multiplication

One other frequently used property is the Distributive Property. Give an example.

47. Be able to extend your ability to solve simple equations to include those containing fractions or decimals.
   Solve each of the following equations.
   a) \[ \frac{1}{2} x - 12 = 4 \]
   b) \[ .25 x + 4 = .5 x \]
   c) \[ \frac{3}{4} x + \frac{1}{2} x = 10 \]
48. Graphing Calculator Skills

Use your graphing calculator to do such things as

- graph an equation of a line (make sure you can set the window so that what you graph fits on your screen)  Ex.  \( y = \frac{1}{2} x + 12 \)
- input a list of numbers into your list screen (STAT…1 Edit) then find the mean, median, minimum and maximum values using STAT….CALC#1..1-Var Stats
- enter a set of ordered pairs using L1 and L1……. remember x coordinates in L1 and y coordinates in L2… turn on a Stat Plot for your lists and set the window to fit your list, graph the points
- find a line of best fit for your data points entered above (Hint: it is under STAT….right arrow to CALC)
- graph a quadratic equation…. (ex.  \( y = x^2 - 4 \)) then use 2nd TRACE and explore what you learn from using choices 1-4
- enter a linear equation into the Y= screen  Enter the equation in Y1.  Then hit 2nd WINDOW this takes you to TBLSET….enter a value you want your table to start (maybe 0) and \( \Delta \) Tbl simply means for you to enter the change you want the table to increase…for example, if you want to go by 1’s enter 1, for 2’s enter 2, etc. Leave Indpnt and Depend highlighted on AUTO.  Now hit 2nd GRAPH.  You now have a table of values that fall on the equation you entered in Y1

You have a wonderful tool at your fingertips….explore the keys that go beyond the 12 gray keys and the four blue operation keys.  If you learn the skills above, you will be at a point where your calculator can be a valuable exploration tool. Take your calculator on long trips or to places where you know you will be sitting/waiting for an extended period of time. Use this time to get to know your calculator. It is to your advantage if you do.

a)  Graph the following on your graphing calculator.  If you do not have a graphing calculator, you can also use Excel and graph them.

\[
\begin{align*}
&y = 5 - 2x \\
&y = 8 - 2x \\
&y = 2x \\
&y = -2x - 3 \\
&y = -4 -2x
\end{align*}
\]

From the graphs, tell which of the equation has the greatest value for \( y \) when \( x = -5 \)

b)  Graph the equation \( y = 0.3 x + 1.5 \) on your calculator. Then find the \( x \)-intercept to the nearest hundredth.

c)  Graph the equation \( y = \frac{3}{2} x \)  Is this equation a direct variation? Explain using complete sentences.

c)  Solve this equation using a graphing calculator.  \( 5.5x + 0.3(4 - x) = 7.2x - 3 \)
d) The data below shows hours spent researching the stock market per week and the percent gain for an investor.

<table>
<thead>
<tr>
<th>Hours</th>
<th>% Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td>34.5</td>
</tr>
<tr>
<td>10</td>
<td>43.5</td>
</tr>
<tr>
<td>12</td>
<td>49</td>
</tr>
<tr>
<td>14</td>
<td>55.5</td>
</tr>
<tr>
<td>16</td>
<td>63.5</td>
</tr>
<tr>
<td>18</td>
<td>70</td>
</tr>
</tbody>
</table>

Use your calculator to find the line of best fit for this data set and predict the gain for 22 hours of research.

e) This table gives data from a plant growth experiment.

<table>
<thead>
<tr>
<th>Time (in weeks)</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4.6</td>
</tr>
<tr>
<td>4</td>
<td>5.8</td>
</tr>
<tr>
<td>7</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Find the line of best fit for this data and predict the height of the plant when

<table>
<thead>
<tr>
<th>Time (in weeks)</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>?</td>
</tr>
<tr>
<td>13</td>
<td>?</td>
</tr>
<tr>
<td>18</td>
<td>?</td>
</tr>
</tbody>
</table>