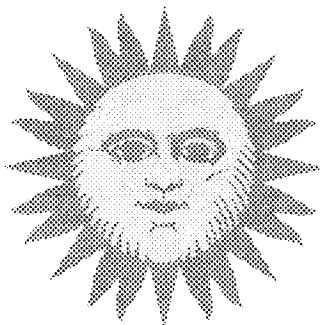


# Summer Math Packet

## Pre IB Algebra II

1. This is worth 3 homework grades the first week of school.
2. You will be tested over this material.



1. Evaluate the expression  $\frac{48}{(3)(7)-5}$ .
2. Evaluate  $4b + 2c$  when  $b = 4$  and  $c = -5$ .
3. A rectangle is twice as long as it is wide and its longer side is 14.2. Find its perimeter.
4. Evaluate the expression  $(3w + 3x)^2$  for  $w = -3$  and  $x = 4$ .
5. The equation  $d = 4.9t^2$  gives the distance, in meters, an object falls in  $t$  seconds. How many seconds would it take for an object to fall 254 meters?
6. Use a calculator to evaluate:  $8 \div 2^3 - 2 + 2^4$
7. Is  $x = 4$  a solution of the equation  $2x - 4 = 8 + x$ ?
8. Write an algebraic expression for "three less than five times a number  $x$ ."
9. Write an inequality to represent the sentence.  
When a number is divided by  $-3$ , and the quotient is increased by  $9$ , the result is less than  $-5$ .
10. Write the numbers in *increasing* order.  $\frac{3}{2}, -10, 0, \frac{2}{3}, -\frac{5}{4}, 1$
11. Evaluate the sum  $17.12 + (-5.23) + |1.72|$ .
12. Simplify the expression  $-7 + x + (2x - 7)$ .
13. Evaluate the expression  $28 - (-x) - |10|$  when  $x = -15$ .
14. Simplify:  $-(3 - x) - 3$
15. Find the difference of the matrices  $\begin{bmatrix} 9 & -3 \\ 4 & 8 \end{bmatrix} - \begin{bmatrix} 2 & 7 \\ -8 & 4 \end{bmatrix}$ .
16. Evaluate the expression  $7x - 3x^2$  when  $x = -2$ .

17. A man buys 6 shirts at \$16 each. There is also a 6% sales tax. Find his total bill.
18. Simplify the expression  $3(2 - x) - 2(3 - x)$ .
19. Remove parentheses by applying the Distributive Property.  $20x(3 - 2x)$
20. Simplify the quotient  $\frac{28x - 14}{7}$ .

Solve the equation.

21.  $\frac{y+1}{2} = 9$

22.  $\frac{x}{2} + \frac{x}{4} = 5$

23. Solve:  $\frac{9}{16}y - 45 = 0$

Solve the equation.

24.  $5x + 14 - 2x = 9 - (4x + 2)$

25.  $4n - 2(3 - n) = -13$

26.  $3x + 17 - 5x = 12 - (6x + 3)$

27.  $7x - 29 - 21x = 3 - (12 + 2x)$

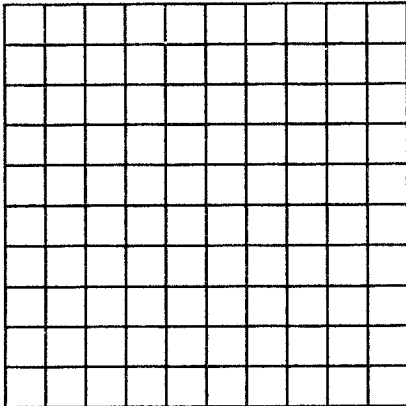
28.  $x(2x - 1) - 10 = -2x(1 - x)$

29. Solve:  $7(a + 3) = 5[a - (1 - a)]$

30. Solve for  $t$  in the equation.  $\frac{7s - 2st}{3} = 4$

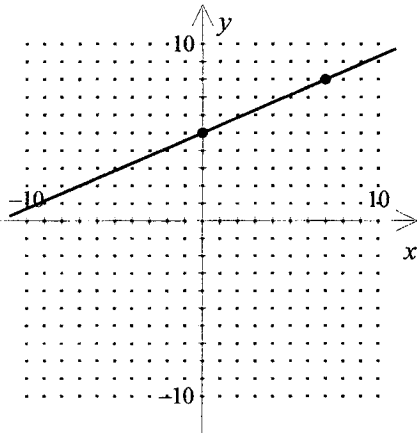
31. Solve for  $m$  in the equation.  $\frac{5m + 2mn}{7} = 12$

32. One video rental club charges \$25 to become a member and \$2.50 to rent each video. Another charges no rental fee, but charges \$3.25 to rent each video. How many videos must you rent to make the first club more economical?
33. Solve  $5x - 3y = 2$ , for  $y$ .
34. Write the equation of the line passing through  $(1, -2)$ ,  $(5, -2)$ , and  $(10, -2)$ .
35. Find the slope of the line passing through the points  $A(2, -3)$  and  $B(-5, 6)$ .
36. Find the *rate of change* between the two points  $(10, 42)$  and  $(13, 75)$  and give the *unit of measure*.  $x$  is measured in hours;  $y$  is measured in degrees.
37. On January 1, Marian received a trust fund worth \$10,721. On April 1, her balance was \$7028. Ignoring interest, find Marian's spending rate in dollars per month for that period.
38. Solve for  $y$ .  $5x - 4y = 12$
39. Find the slope and  $y$ -intercept of the line.  $2x - 5y = 10$
40. Rewrite the equation in slope-intercept form.  $5x - 2y - 7 = 0$
41. Write in slope-intercept form and sketch the line.  $4x + 3y - 8 = 0$



42. Find the coordinates of the vertex of the graph.  $y = |x - 3| + 2$
43. Solve:  $5 = |-2 + 5x|$

44. Write an equation of the graph in slope-intercept form.



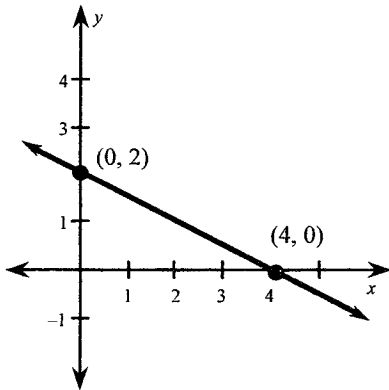
45. Write the equation  $y - 2 = -\frac{2}{3}(x + 6)$  in slope-intercept form.

46. Write an equation of a line with slope  $-3$  passing through the point  $(-5, 2)$ .

47. Find an equation of a line that passes through the point  $(3, -2)$  with a slope of  $\frac{3}{2}$ .

48. Write an equation for the line containing  $(1, 5)$  and  $(-3, -11)$ .

49. Write an equation of the line shown on the graph.



50. Write the equation of the line in slope-intercept form that passes through the points  $(7, -1)$  and  $(2, 9)$ .

51. Write the equation of the line in slope-intercept form that passes through the points (7, -1) and (2, 8).

52. Write  $y = -\frac{7}{8}x - \frac{1}{2}$  in standard form.

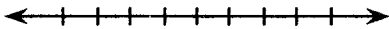
53. Rewrite the equation  $y = -\frac{3}{4}x - \frac{1}{2}$  in *standard form* with integer coefficients.

54. A revenue of \$1500 is obtained from the sales of item *A* at \$50 each and item *B* at \$25 each. Write an equation that shows the relationship between the numbers of items sold.

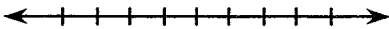
55. A grocery store knows that if it sells its canned hams for \$8 each, it can sell 950 per month, and if it sells the same hams for \$6, it will sell 1000 per month. Assuming the relationship between price and sales is linear, write the equation you could use to predict sales for other prices.

56. A real estate sales agent receives a salary of \$1500 per month plus a commission of 1% of sales. Write a linear model for the monthly income  $y$  in terms of sales  $x$ .

57. Sketch a graph of the inequality  $4 \leq x$ .



58. Sketch a graph of the inequality  $-3 \leq x$ .



59. Solve and graph the inequality:  $4x + 3 < 2(x + 3)$

60. Solve the inequality  $4 - 3x \geq x + 3$ .

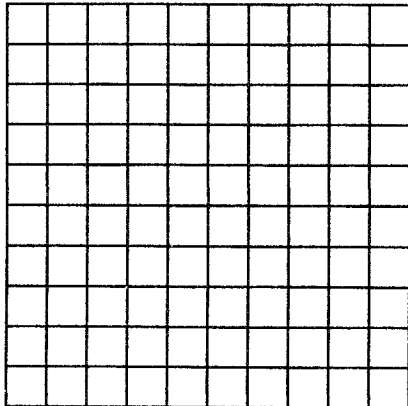
61. Solve the inequality  $2x + 4 > 1 - 2x$ .
62. Solve:  $-9 \leq -3x + 15 \leq 12$
63. Solve the inequality  $4 < 2(1 - 3x) < 10$ .

Solve:

64.  $|x + 6| \leq 1$
65.  $|2x + 3| > 1$
66. Solve the inequality  $|2 - x| \leq 2$ .

Graph:

67.  $5x - 6y \leq -30$
68.  $x + y = -9$   
 $3x - y = -11$
69. Use a straightedge to draw straight lines. Solve the linear system by graphing.  
 $x + y = 1$   
 $3x - y = -5$



70. Solve by substitution:  $x + 2y = 9$   
 $y = x + 3$

71. Use substitution to solve the linear system.

$$x + 4y = -1$$

$$2x - y = 7$$

72. Solve by linear combinations:  $4x - 2y = 0$

$$x + 2y = 5$$

73. Use linear combinations to solve the linear system.

$$3x - 4y = 21$$

$$4x + 2y = 6$$

74. Use linear combinations to solve the linear system.

$$4x + 3y = -2$$

$$3x + 2y = -3$$

75. Solve the linear system by any method.

$$5x - 2y = 3$$

$$-x + 6y = -2$$

76. A jumbo jet carries 280 passengers, 32 in first class, and the remainder in coach. If the average first class ticket is \$600 and the average coach ticket is \$310, what will the airline gross if the plane is full?

77. A total of \$10,000 is invested in two funds paying 5% and 7% annual interest. The combined annual interest is \$644. How much of the \$10,000 is invested in each fund?

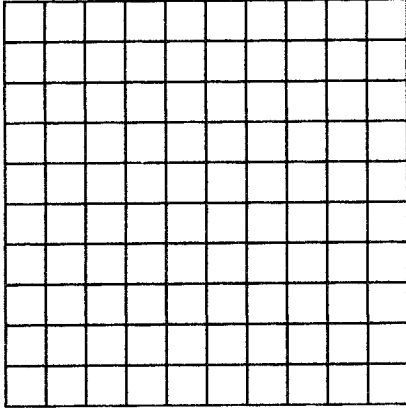
78. Solve the system graphically:  $y \geq x - 4$

$$y \leq -2x - 8$$

79. Sketch the graph of the system of linear inequalities.

$$y < \frac{1}{2}x$$

$$y > \frac{3}{2}x - 2$$



80. Simplify,  $(8x^3)^2(\frac{1}{4}x^2)^3$ .

81. Simplify  $(2x)^4(\frac{1}{2}x^3)^2$ .

82. Evaluate  $(a^3b^2)^2$  when  $a = -1$  and  $b = -2$ .

83. Evaluate  $-3 \cdot (-2)^x$  when  $x = 4$ .

84. Solve for  $x$ .  $3^2 \cdot 3^4 \cdot 3^5 = 3^x$

85. Rewrite using only positive exponents:  $2ab^3c^{-4}$

86. Rewrite the express using positive exponents.

$$\frac{1}{9x^{-2}y^{-1}}$$

87. Rewrite the expression using positive exponents.  $\frac{-3^0}{4x^{-3}}$

88. Simplify:  $\frac{-16x^6y^4}{-8x^5y^6}$

89. Simplify the expression  $\frac{8x^2y^{-2}}{x^{-2}y} \cdot \frac{(4xy^2)^{-1}}{x^2y}$ .

90. Simplify the expression  $\frac{5x^3y^{-1}}{x^{-2}y^2} \cdot \frac{(5x^2y)^{-1}}{xy^{-1}}$ .

91. Write 816,000 in scientific notation.

92. Write 0.00553 in scientific notation.

93. Evaluate  $(2.71 \times 10^{-3})^2$  and write the result in both decimal form and scientific notation.

94. Evaluate. Express the product in scientific notation.  $(4.5 \times 10^7)(1.4 \times 10^2)$

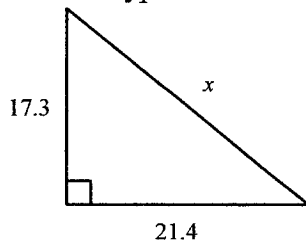
95. The side of a cube is  $7.24 \times 10^2$  inches. Write the *volume* of the cube in scientific notation.

96. A principal of \$500 is deposited in an account that pays 6% annual interest compounded yearly. Find the balance after 10 years.

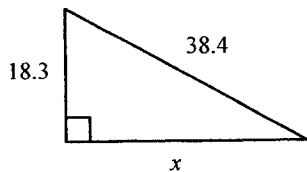
97. How much must you deposit in an account that pays 6% annual interest compounded yearly to have a balance of \$500 after 5 years?

98. Find all square roots of the number 0.0081.

99. Find the hypotenuse of the triangle. Round your result to one decimal place.



100. Find the side of the triangle. Round your result to one decimal place.



101. Solve:  $16x^2 - 25 = 0$

102. Solve the equation. Round your results to two decimal places.  $6x^2 = 961$

103. An object is dropped from an initial height of  $s$  feet. The object's height at any time  $t$ , in seconds, is given by  $h = -16t^2 + s$ . How long does it take for an object dropped from 300 feet to hit the ground? Round your result to two decimal places.

104. Find the coordinates of the vertex and determine whether the graph opens *up* or *down*.

$$y = -x^2 + x - 5$$

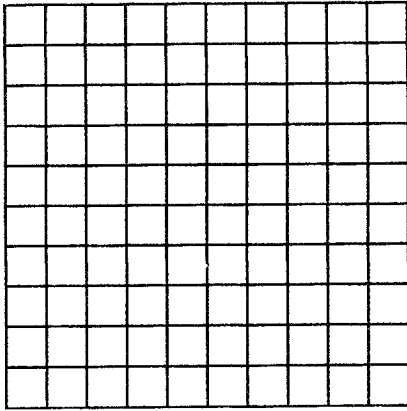
105. Solve:  $x^2 - 4x - 3 = 0$

106. Solve by the quadratic formula:  $4x^2 + 8x + 1 = 0$

107. Use the quadratic formula to solve the equation to the exact value or round to two decimal places.  $x^2 - x - 5 = 0$

108. The height of an object thrown upward with velocity  $v$  feet per second is given by  $h = -16t^2 + vt$ , where  $t$  is time measured in seconds. If an object is thrown upward with a velocity of 96 ft/sec from ground level, ( $h = 0$ ), how long will it take to return to ground level?

109. Sketch the graph of the inequality.  $y \leq x^2 - 2x - 3$



110. Simplify:  $(4q^4 + 4) - (3q^2 + 5) + (8q^4 - 5q^2)$

111. Subtract  $z^3 - 3z - 6$  from  $3z^3 + 2z^2 + 7$ .

112. Perform the indicated operations.  $-3(4u + 2) + 5(2u - 3) - 3(3u - 4)$

113. Multiply.  $(8v + 3)(8v - 3)$

114. Multiply:  $(x + 3)(x^2 + 2x + 1)$

115. Multiply  $-x^2(-3x^2 + 2x - 4)$ .

116. Use the FOIL pattern to multiply  $(2x - 5)(3x + 4)$ .

117. Multiply:  $(2x^2 - 3)^2$

118. Write  $(3x - 2)^2$  as a trinomial.

119. Multiply  $(7x - 4)(7x + 4)$ .

120. Factor completely:  $9x^2y^2 + 24xy + 16$

121. Find the greatest common factor of the three terms.  $48A^{10}y^7$ ,  $64A^8y^6$ ,  $72A^9y^7$

122. Factor out the greatest common monomial factor.  $24u^3 + 40u^2$

123. Factor the expression  $4x^2 + 28xy + 49y^2$ .

124. Factor the expression  $3x^2 + 24x + 48$ .

125. Factor the expression  $9x^2 - 30xy + 25y^2$ .

126. Factor the expression  $5m^4 - 70m^3 + 245m^2$ .

127. Factor:  $x^2 + 11x + 28$

Solve:

128.  $x^2 + 3x - 10 = 0$

129.  $3x^2 + 8x = -4$

130. Solve the equation  $2x^2 + 3x - 9 = 0$ .

131. Solve the equation  $4x^2 + 7x - 2 = 0$ .

132. Find the term that must be added to the expression to create a perfect square trinomial.  
 $x^2 + 15x$

133. Solve by completing the square.  $t^2 + 6t - 3 = 0$

134. Solve by completing the square.  $w^2 + 5w + 2 = 0$

Use your calculator as needed.

135. Solve the proportion  $\frac{18}{x-2} = \frac{4}{3}$ .

136. Solve the proportion  $\frac{x+1}{3} = \frac{x+5}{x}$ .

137. Use your calculator as needed. Solve the proportion  $\frac{x-1}{3} = \frac{x+5}{x-1}$ .

Give answers to one decimal place where needed.

138. What is 18% of 180 miles?

139. 50 people is what percent of 210 people?

140. 90 is 36% of what number?

141. 182 is 2.5% of what number?

142. In a certain week, the New York stock market went down from 1813 to 1582. What was the percent of decrease to the nearest whole percent?

143. The price per person of renting a bus varies inversely with the number of people renting the bus. It costs \$18 per person if 51 people rent the bus. How much will it cost per person if 78 people rent the bus?

144. Simplify:  $\frac{-8x}{x-x^2}$

145. Simplify the expression  $\frac{x^2-9}{x^2+3x}$ .

146. Simplify the expression  $\frac{x^2+4x}{x^2-16}$ .

147. Simplify the expression  $\frac{13x^5}{12x^3} \cdot \frac{6x^2}{4x^6}$ .

148. Simplify the expression  $\frac{2}{x-3} \cdot \frac{2x-6}{8(x+4)}$ .

149. Simplify the expression  $\frac{15x^3}{8x^5} \div \frac{10x^4}{4x}$ .

150. Simplify the expression  $\frac{x^2 + 2x + 1}{4x^2 + 4x} \div \frac{8x}{x^2 - 1}$ .

151. Divide  $(3x^2 - 2x + 7) \div (x - 2)$ .

152. Divide  $(8x^3 + 6x^2 - 3x + 1) \div (2x - 1)$ .

153. Solve the equation  $x - \frac{24}{x} = -2$ .

154. Solve the equation  $5 - \frac{6}{x+3} = \frac{3-x}{x^2-9}$ .

155. Solve:  $\frac{x}{5} - \frac{x}{8} = 3$

156. Evaluate  $f(-3)$ .

$$f(x) = 2x^2 + 4x - 7$$

157. Find the distance between the two points.  
 $(-4, -2), (2, 3)$

158. Decide whether the three points are the vertices of a right triangle.  
 $(-4, 4), (3, 1), (-2, -1)$

159. Determine the coordinates of the midpoint of  $\overline{DB}$  and find the distance  $DB$  for the points  $D(2, -4)$  and  $B(1, 2)$ .

160. Find the midpoint between the two points.  
 $(7, -3), (5, 4)$

Simplify:

161.  $\sqrt{294}$

162.  $\sqrt{28}$

163. Simplify:  $\sqrt{30} \cdot \sqrt{12}$

164. Simplify the radical expression.

$$\sqrt{\frac{20}{27}}$$

165. Simplify the radical expression.

$$\sqrt{\frac{27}{8}}$$

Simplify:

166.  $\sqrt{50} + \sqrt{72}$

167.  $2\sqrt{2} - \sqrt{36} + 8\sqrt{32}$

168. Perform the indicated operations and simplify the result.

$$(\sqrt{2} + \sqrt{3})\sqrt{6}$$

169. Solve the equation, if possible.

$$\sqrt{2x+7} = 5$$

170. Solve the equation, if possible.

$$\sqrt{2-x} = 2-x$$