

Algebra Ninja v1

skills needed to sneak up on the
SAT \cap ACT \cap MCA
www.AlgebraNinja.com for video
lessons on each type of problem

Simple Numbers

1. $\sqrt{25}$
2. simplify $\sqrt{32}$
3. estimate $\sqrt{65}$
4. $-6 * 7$
5. $-5 + -9$
6. 2^4
7. $-(-11)$
8. $-7(a - 1)$
9. $-(x - 1)$
10. $2 + 4(5 - 1)$
11. $(-2)^2$ vs -2^2 which is 4?
12. long divide $207 \div 9$
13. $.25 = \frac{?}{?} = ?\%$
14. $\frac{1}{5} = .?? = ?\%$
15. Give the unit rate if the

data gathered was:

27 miles per 3 hours

16. $.8 \times .03$
17. $-15[] - 10, ><=?$
18. $2.5 \times 10^{-3} = ?$
19. $\frac{2}{3} = \frac{n}{-12}$
20. $|-3| = ?$
21. $-|-5| = ?$
22. $\sqrt{-36}$
23. $\sqrt{x^2}$
24. $3\sqrt{7} + 9\sqrt{7}$

Principles of Exponents

25. a^0
26. $a^x a^y$
27. $\frac{a^x}{a^y}$
28. $(a^x)^y$
29. $(x + 3)^2$
30. $(3a^x)^2$
31. rewrite \sqrt{a} as $a^?$
32. $\sqrt[n]{a}$
33. $\sqrt[n]{a^m}$

34. a^{-x}

35. $\sqrt[n]{\frac{a}{b}}$

36. a^{-1}

Fractions & Cancelling

37. simplify $\frac{5a+a}{a}$
38. $\frac{2}{3}$ of 6 =
39. $(\frac{1}{2}) + (\frac{3}{5})$
40. $(\frac{1}{3}) \div (\frac{3}{4})$
41. $-(\frac{-1}{-5})$
42. $(\frac{2}{3}) \times (\frac{6}{5})$
43. $1\frac{2}{5} = \frac{?}{?}$
44. rewrite $\frac{a+b}{c}$
45. rewrite $\frac{3}{5}a$
46. $\frac{1}{\frac{1}{n}}$
47. $\frac{8}{7}$ rewrite as mixed #
48. $\frac{20}{35}$ reduces to $\frac{?}{?}$
49. $a * \frac{b}{c}$

50. $\frac{\frac{a}{b}}{\frac{c}{d}}$

51. $\frac{\frac{a}{b}}{\frac{c}{d}}$

52. $(7)\left(\frac{2}{5}\right)$

Factoring/Foiling

53. $x^2 + 4x + 3$

54. $x^2 - 2x - 8$

55. $6x^2 + 12x - 18$

56. $x^2 - 25$

57. $3x^2 + 7x + 2$

58. *factor* $ab + ac =$

59. $(x + 2)(x - 2)$

60. $(x + 2)(x + 3)$

61. $(x + 4)^2$

Variables

62. $ab \times ab$

63. $pb + pb$

64. $2x + 5 - 8x$

65. *rewrite* $aaaa$

66. *rewrite* $aabb$

67. $3(m + b)$

68. $-(2 - x)$

69. $3a^2 + 7a^2$

70. $4a - 3a$

71. $-5a - 4a$

72. $2(5x)$

73. $10x^3/2x^3$

74. $\frac{12xy^2}{3x^3}$

Basic Equation/Ineq

75. $\frac{2}{3} = \frac{n}{8}$

76. $2a = 9$

77. $-a = 2$

78. $\frac{2}{3}n = 6$

79. $2n + 1 = 9n$

80. $n + 1 = n + 8$

81. $\frac{n+3}{2} = \frac{n}{8}$

82. $-3x \leq 6$

83. $|x| = 6$

84. $|3x - 1| = 5$

85. Solve

$$0 = (x - 4)(x + 5)$$

86. Solve w/substitution

$$y = 2x - 7$$

$$y = x - 5$$

87. Solve w/elimination

$$-2x + 3y = 1$$

$$x + y = 2$$

88. Solve with the

quadratic formula:

$$0 = x^2 + 3x - 2$$

89. Show all steps:

$$3\left(\frac{x}{3} - 2\right) + 1 = 5(x - 2) - 4$$

Memorization

90. $10^2, 11^2, 12^2, 13^2, 14^2, 15^2$

91. $2^3, 3^3, 4^3, 5^3$

92. *number of feet in 1 mile*

93. *distance = rate * ?*

94. *__ ounces = 1 pound*

95. *__ weeks in year*

96. *1 liter ≈? quart(s)*

97. *1 in = __ cm*

98. *1 pint of water = ?*

Trigonometry

99. *define Sin*

100. *define Cos*

101. *define Tan*

Data Handling

102. *Mean of 3,3,4,6*

103. *Median of 3,3,4,6*

104. *Mode of 3,3,4,6*

105. *Range of 3,3,4,6*

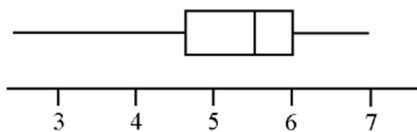
106. *Outlier in 3,4,4,20.*

107. *If outliers exist*

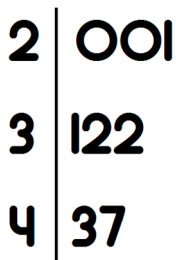
then use ____ not ____.

108. *This box & whiskr*

has what median? max?



109. *This stem & leaf*



Has what maximum?

Functions

110. *Evaluate*

$$f(x) = 7x - 1 \text{ at } x = 2$$

111. *Which test will*

tell you if a graph is a

function?

112. *(2,3), (2,4),*

(3,6), (4,9) is this

relation a function?

113. *sketch $y = x$*

114. *sketch $y = x^2$*

115. *sketch $y = |x|$*

116. *sketch $y = \sqrt{x}$*

117. *sketch $y = x^3$*

118. *sketch $y = 2^x$*

119. *When looking at*

$$y = -(x + 2)^2 - 3$$

list transformations :

120. *if $f(x) = \frac{1}{x}$*

what is domain $f(x)$?

Terminology

121. *Given a function*

$$f(x) = 3x^2 - 2x - 1, \text{ what}$$

is its lead coefficient?,

constant?

122. *T/F You can use*

a regression equation

as a line of best fit.

123. A radian is a measure of degrees which is about 180/?
124. A recursive sequence is as follows
 $u_0 = 20$
 $u_n = u_{n-1} * 3$
 What is $u_1 =$
125. Given a function
 $f(x) = x^2 - 2x - 1$
 Compute the discriminant then tell how many solutions $f(x)$ will have.
126. Domain is like the inputs(x), range is like outputs(y). T/F
127. Inverse of 4 =
128. Reciprocal of 4
129. Sum means:
130. Difference means:
131. Product means:
132. Quotient means:
133. Factors of 6:
134. Rewrite this equation in standard form: $y = 2x - 5$
135. Rewrite this equation in slope intercept form:
 $2x - y = 7$
136. What form is this equation in?
 $(y - 2) = 4(x - 5)$
137. What is the rate of growth or decay in this exponential eqn?
 $y = 4(1.1)^x$
138. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 is what formula?
139. Rational numbers can be written as a _____.
140. Give an example of an irrational #:
141. List the first 4 prime numbers:
142. Cross out the non-integer on this list: -5, 0, 2, 7.5, 20
143. If any even integer is represented as $2n$, what would any odd integer be?
144. If 2 consecutive integers are n and $n+1$, what is the next consecutive integer?
145. Old price for gas=\$2.00 New=\$3
 What is % of change?

Geometry/formulas

146. *area of rectangle =*

147. *area of triangle =*

148. *area trapzoid =*

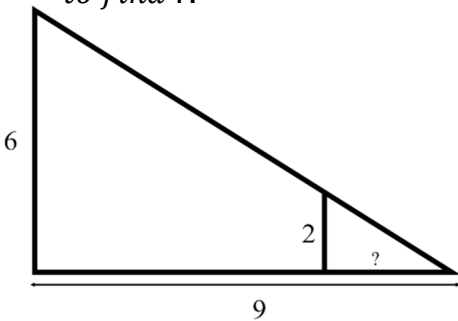
149. *area of circle =*

150. *Area formula for a parallelogram =*

151. *Pythagorean thm:*

152. *use proportional Δs*

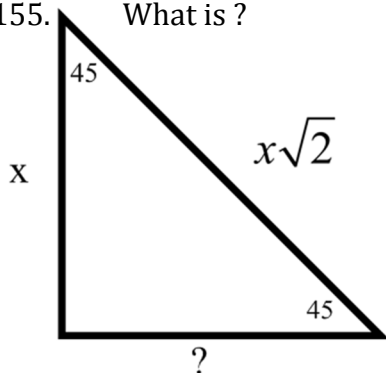
to find ?:



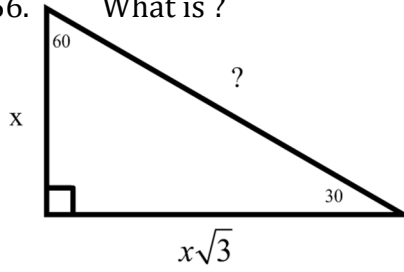
153. *Distance Formula:*

154. *Midpoint Formula: =*

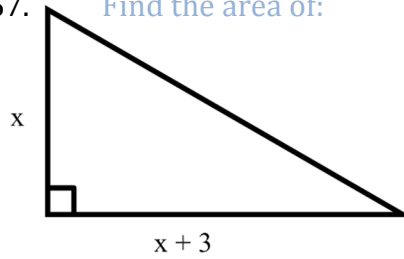
155. What is ?



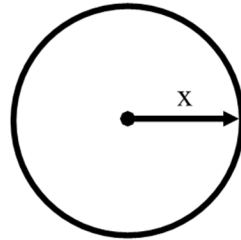
156. What is ?



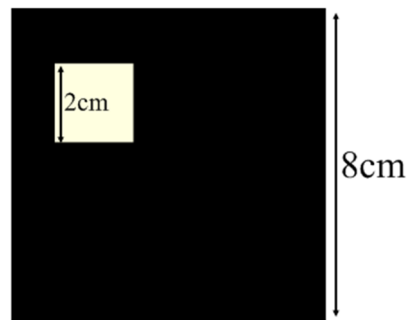
157. Find the area of:



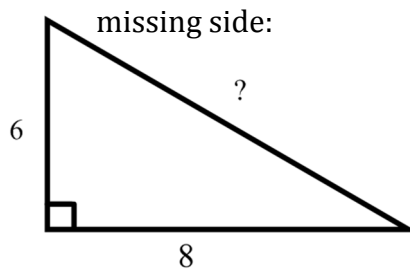
158. Find the area of:



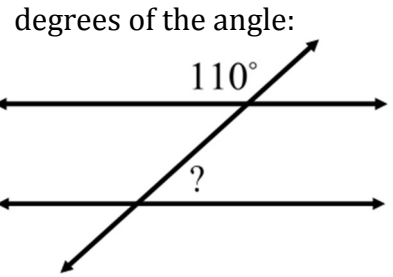
159. Find dark area:



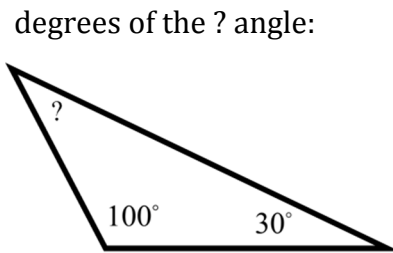
160. Find the



161. Find the



162. Find the



163. Could these 3 sides make a triangle:
1 in, 2 in, 3 in?

164. If the circumference of a circle is 8π , what is its diameter?

165. A cube has a side length of 3 in. What is its surface area?

Probability

166. Given a jar with 4 marbles, 3 red and 1 white, what is $P(R,W)$ given no replacement.

167. Given a coin is flipped and a die is rolled. What's $P(H,3)$:

168. In which does order matter, Permutation or Combination?

169. Set up a " 9P_2 " for a race with 7 runners and 3 places.

170. Set up a " 9C_2 " for a committee made up of 3 people chosen from 20.

171. Set up a " 9C_2 " ...If there are 3 types

of meats and 4 kinds of cheese, how many pizzas can be made which have one meat and one cheese?

172. Set up a " 9C_2 " ...In a 5 card game with a 52 card deck, what $p(3 \text{ kings and } 2 \text{ queens})$ being dealt?

173. Just set up the binomial for this: Jim has a 85% free throw average. In 4 shots what's the probability of missing exactly 2.

Polynomials

174. What is the degree of this?
 $y = -5x^3 - 2x^2 - x + 7$

175. What is the degree of this?
 $y = (x - 3)^2(x + 1)^3$

176. Linear polynomials have what degree?

177. Quadratic polynomials have what degree?

178. Cubic polynomials have what degree?

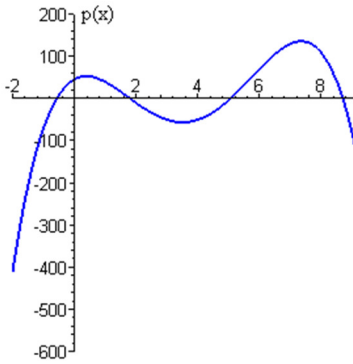
179. List the right end behavior of graph for $y = -5x^2 - x + 7$

180. What is the L and R end behavior of the graph of:

$$y = 2x^3 - 2x^2 - x + 7$$

181. Given graph of

polynomial below



locate and label local

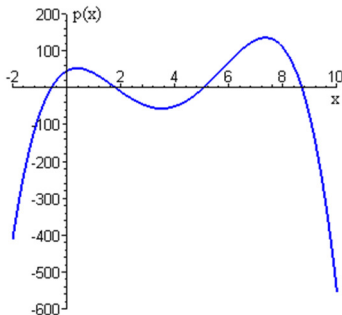
mins, maxes.

182. Extrema refers

to all local minimums

and maximums. T/F

183. Given graph:



Does this have absolute min?

Graphing

184. define slope

___ over ___

185. Given

$$y = 2x + 1 \text{ find 3}$$

points on line.

186. A line parallel to

$$y = 2x - 4 \text{ has slope of?}$$

187. A perpendicular

line to $y = 2x - 4$ would

have what slope?

188. Given slope -3

and y intercept = 5

write the equation:

189. Given

point (3,2), Slope 2

Write the equation:

190. Given

$$y - 4 = 3(x - 2)$$

Identify a point & slope.

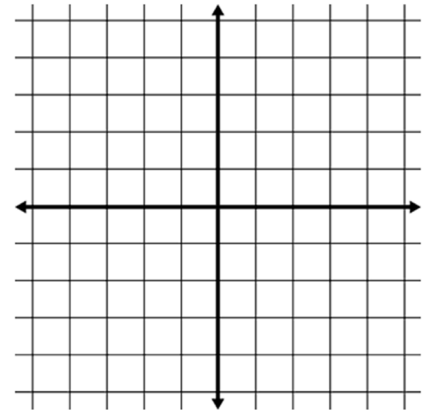
191. Given

point(3,2) point (4,6)

Find the slope:

Use the following graph for

the next five problems



192. label x axis

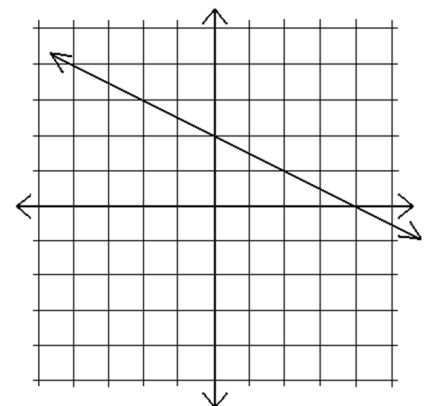
193. label y axis

194. graph $y = 3$

195. graph $x = 2$

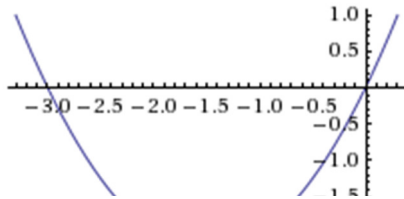
196. gph $y = 2x - 3$

197. write eqn for this

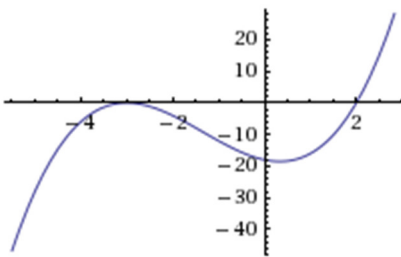


198. Which axis is
domain about, x or y?

199. Identify and
label roots of the
quadratic graphed.



200. Identify
minimum degree of
the polynomial
graphed below.



201. The y intercept
is found where $x = \underline{\hspace{1cm}}$

202. Sketch a graph
of exponential growth