

## SUMMER Review After Gr10 AP



### Big idea

This is a booklet you can work through during the summer after your gr10 AP class. This will review the gr11 topics that we started in our last semester. Feel free to submit this booklet as a mark boost on your first day of class. All questions must be done in the corresponding section to qualify for a mark boost for that particular unit. Random questions will be selected to be marked. If questions are done with an accuracy below 80% then no boost will be assigned. If any copying of others is detected, no boost will be assigned. Below are the maximum marks to earn.



### Plan your summer days ahead to achieve your Goals

Date	Pages	Topics	Marks to earn
	2-5	Algebra	Unit A p2 up to 4% on TEST entry
	6-11	More Algebra	Unit A p3 up to 6% on TEST entry
	12-18	Functions	Unit F up to 7% on TEST entry
	19-22	Rotational Trig	Unit G up to 4% on TEST entry

If any of the bonuses go over max of 100 on a test entry, % is kept but final grade can only be 99%.

**ASSIGNMENT Algebra p2**

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Expand

1.  $(2 - x)(3x + 4x^2)$

2.  $(5x^2 + y^3)^2$

3.  $3x(x + 2)(x - 1)$

4.  $-5x(2x - 6)(x + 1)$

Factor fully.

5.  $28a^2 - 7a^3$

6.  $8m^3 - 4m^2$

7.  $p^4 - 3p^2 - 54$

8.  $n^4 - 4n^2 - 45$

9.  $8 - x^2$

10.  $x^2 - 6$

11.  $21x^2 + 8xy^4 - 4y^8$

12.  $4b^2 - 7b + 3$

13.  $6a^2 - 13a - 5$

14.  $56x^4 + 18x^2y - 8y^2$

15.  $(4x - 1)^2 - 25$  factor without expanding

16.  $(2c - 5)^2 - 121$  factor without expanding

17.  $2x^2y - 8xy - 5x + 20$

18.  $6d^2e - 15de - 14d + 35$

Simplify and state any restrictions on the variables.

$$19. \frac{4c+16}{5c} \times \frac{15c^3}{c+4}$$

$$20. \frac{5y^3z^5}{7z^2} \times \frac{14yz^4}{30y^2z^3}$$

$$21. \frac{4-x}{3x^2-4x-4} \div \frac{5x-20}{6x^2-17x+10}$$

$$22. \frac{2x^2+7x+3}{x-4} \div \frac{2x^2-7x-4}{x^2-16}$$

$$23. \frac{m}{3m^2-9m+6} - \frac{2m+1}{3m^2+3m-6}$$

$$24. \frac{5k}{k^2-k-6} + \frac{4}{k^2+4k+4}$$

Factor Cubes.

25.  $512x^3 + 1$

26.  $x^3 + 1000$

27.  $64x^3 - 1331$

28.  $5^{3x} + 8$

29.  $27x^3 + 8$

30.  $216x^3 - 125y^3$

31.  $8m^3 - 27n^3$

32.  $\frac{1}{27}x^3 - \frac{8}{125}$

Factor smallest exponent out, put answers in positive exponent form. State restrictions.

33.  $2x - 3 + 4x^{-1} - 5x^{-2}$

34.  $3x^{3/2} - 9x^{1/2} + 6x^{-1/2}$

35.  $-2x^4(x^2 + 1)^{-2} + 3x^2(x^2 + 1)^{-1}$

36.  $2(3x - 1)^{-1} - 3(2x + 5)(3x - 1)^{-2}$

37.  $(6 - 3t)^4 + (t)[4(6 - 3t)^3(-3)]$

38.  $(x + 1)^2[4(3x - 5)^3(3)] + (3x - 5)^4[2(x + 1)(1)]$

Factor smallest exponent out, put answers in positive exponent form. State restrictions.

39.  $-\frac{1}{2}x^2(4-x)^{-1/2} + 2x(4-x)^{1/2}$

40.  $4x(x^3 + 2)^{-1} - 3x^2(2x^2 - 1)(x^3 + 2)^{-2}$

Factor without expanding

41.  $(x^2 + 4x)^2 + 7(x^2 + 4x) + 12$

42.  $(x^2 + 2x)^2 - 2(x^2 + 2x) - 3$

Change from exponential to root form or vice versa. Simplify radicals to lowest radical at the end or at the beginning.

43.  $6^{\frac{3}{2}}$

44.  $8^{\frac{5}{2}}$

45.  $\sqrt[3]{5^4}$

46.  $\sqrt[5]{3^6}$

47.  $\sqrt[4]{3a}$

48.  $\sqrt[5]{(7x^3)}$

Simplify, record in proper form (no decimals, no negative powers, roots reduced). Ensure you state either restrictions or put in absolute values where needed.

49.  $\sqrt{xy} \sqrt{x^3y}$

50.  $(2x^2y^4)^{3/2}$

**ASSIGNMENT Algebra p3**

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Simplify. No decimals. No negative exponents in final answers. State restrictions where needed.

51.  $(5x^2y^3)^2$

52.  $2x(3x)(4x^2)$

53. 
$$\frac{2xy}{(2x^2y)(4xy^3)}$$

54. 
$$\frac{3a^2b^5}{(3a^2b)(6ab^3)}$$

55. 
$$\left(64n^{12}\right)^{-\frac{1}{6}}$$

56. 
$$\left(81n^6\right)^{-\frac{1}{2}}$$

57. 
$$\frac{2x^{-\frac{7}{4}}}{4x^{\frac{4}{3}}}$$

58. 
$$\frac{6x^{-\frac{5}{4}}}{12x^{\frac{1}{3}}}$$

Simplify each expression, rationalize demonimator if needed.

59.  $7\sqrt{12} - 3\sqrt{28} + 4\sqrt{48} - 8\sqrt{63}$

60.  $-5\sqrt{45} + \sqrt{52} + 3\sqrt{125} + 9\sqrt{208}$

61.  $(6 - \sqrt{5})(3 + 2\sqrt{10})$

62.  $(4 - \sqrt{3})(6 - 2\sqrt{15})$

63.  $\frac{3\sqrt{15}}{6\sqrt{20}}$

64.  $\frac{12\sqrt{18}}{4\sqrt{24}}$

65.  $\frac{\sqrt{5}}{3 - 2\sqrt{5}}$

66.  $\frac{\sqrt{7}}{5 + 3\sqrt{7}}$

Solve each question for  $x$ .

67.  $x^{\frac{5}{4}} = 243$

68.  $x^{\frac{3}{2}} = 125$

69.  $26 = -1 + (27x)^{\frac{3}{4}}$

70.  $5 = 3 + 4x^{\frac{-1}{6}}$

71.  $3^{1-2x} = 243$

72.  $4^{1-2x} = 1024$

73.  $6^{3x} \cdot 6^{-x} = 6^{-2x}$

74.  $10^{-3x} \cdot 10^x = \frac{1}{10}$

75.  $3^x = 29$

76.  $6^x = 51$

77.  $5 \cdot 18^x = 25$

78.  $9^x + 3 = 14$



Simplify, record in proper form (no decimals, no negative powers, roots reduced). Ensure you state either restrictions or put in absolute values where needed.

79. 
$$\frac{\sqrt[4]{32x^4}}{\sqrt[4]{2}}$$

80. 
$$\sqrt{16a^4b^3}$$

81. 
$$(x^{-5}y^3z^{10})^{-3/5}$$

82. 
$$\frac{\sqrt[5]{96a^6}}{\sqrt[5]{3a}}$$

83. 
$$\frac{\frac{y}{x} - \frac{x}{y}}{\frac{1}{y} - \frac{1}{x}}$$

84. 
$$\frac{\frac{x}{y} + 1}{1 - \frac{y}{x}}$$

85. 
$$\frac{x^{-1} + y^{-1}}{(x + y)^{-1}}$$

86. 
$$\frac{x^{-2} - y^{-2}}{x^{-1} + y^{-1}}$$

Simplify. No decimals. No negative exponents in final answers. State restrictions or absolute values where needed.

$$87. \frac{3y^{\frac{1}{4}}}{4x^{\frac{-2}{3}}y^{\frac{3}{2}} \cdot 3y^{\frac{1}{2}}}$$

$$88. \frac{5y^{\frac{-2}{3}}}{3x^{\frac{2}{3}}y^{\frac{5}{2}} \cdot 5y^{\frac{-1}{2}}}$$

$$89. \frac{\left(4x^3y^{-2}\right)^{\frac{3}{2}}}{\left(16x^{-1}y^{\frac{-2}{3}}\right)^{\frac{1}{4}}}$$

$$90. \frac{\left(16x^{-12}y^8\right)^{\frac{-5}{4}}}{\left(4x^4y^{\frac{-2}{3}}\right)^{\frac{3}{2}}}$$

Solve for x. Check.

91.  $\sqrt{x-6} + 12 = x$

92.  $\sqrt{x+4} + 16 = x$

Simplify and state the domain for the function.

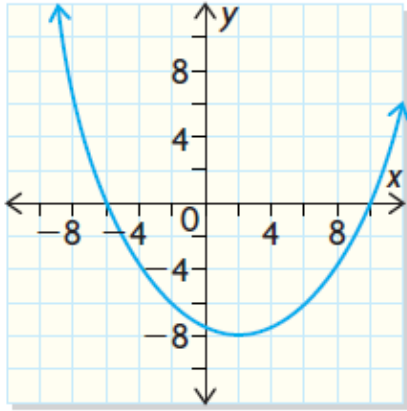
93.  $f(x) = \frac{-3x^2 - 9x + 30}{x - 2}$

94.  $p(q) = \frac{q^2 - 14q + 49}{q^2 - 49}$

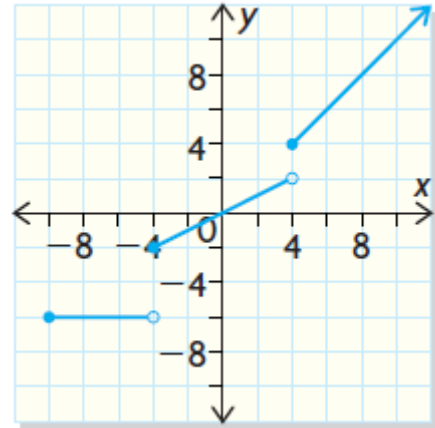
**ASSIGNMENT Functions**

Find the domain and range of each of the following. Record in set notation.

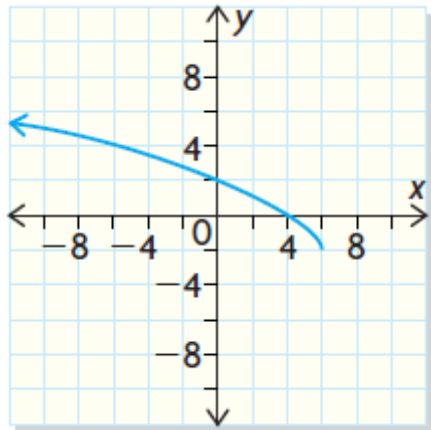
95.



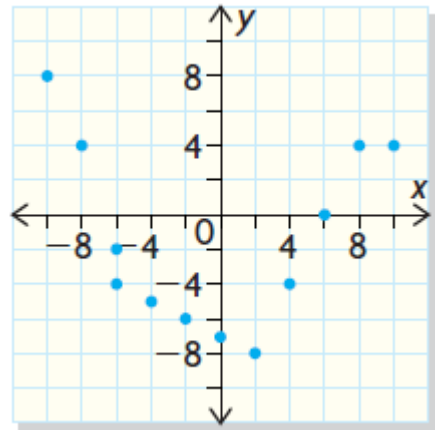
96.



97.



98.



Determine if these are functions or not

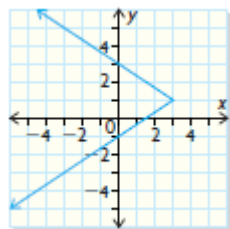
99.  $3x^2 - 4y^2 = 12$

100.  $y = \pm \sqrt{x + 2}$

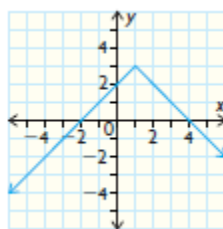
101. The relation between distance and time if Bran walks at 5km/h

102. The relation between student's ages and the number of credits earned

103.



104.



105.  $\{(0, 4), (3, 5), (5, -2), (3, 8)\}$

106.  $\{(-2, 3), (2, 6), (-2, 3), (4, 8)\}$

Find the domain without graphing for the following equations. Record in interval notation.

107.  $y = 2 - 3x^4 + 5x^3$

108.  $y = 2 - 3\sqrt{12 - 4x}$

109.  $y = 3\sqrt{6x + 24} - 5$

110.  $y = 2 - x^3 + 4x^2 - x$

111.  $y = \frac{5x}{4x^2 - 8x}$

112.  $y = \frac{x}{x^2 - 5x - 6}$

113. a. Write the radius of a circle as a function of its area. (Area is input, radius is output).  
b. What type of function is this? (linear, quadratic, rational, square root...)

114. a. Write the length of the rectangle as a function of its area. (Area is input, length is output.)  
b. What type of function is this? (linear, quadratic, rational, square root...)

For each of the following

a. State the transformations

b. Sketch by showing all details ie. Image points

115.  $y = |-2(x + 3)| - 4$

116.  $y = -\sqrt[3]{0.5x - 3} + 8$

117.  $y = \sqrt{-0.5(x - 3)} - 2$

118.  $y = -3x^2 + 24x - 2$

For each of the following

- write the equation for the new transformed function.
- sketch show only shifts and reflections
- what is the domain and range of this function?

119. Given the function  $f(x) = \frac{1}{x}$ , and the

transformations:

horizontal stretch (decide 2 or  $\frac{1}{2}$ )

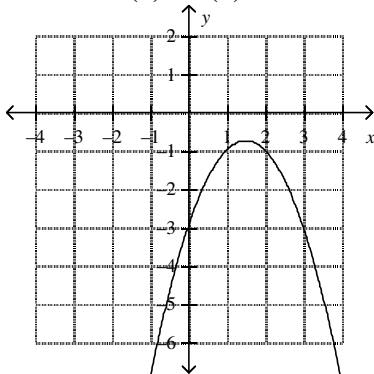
vertical stretch (decide 5 or  $\frac{1}{5}$ )

reflection in the  $y$ -axis

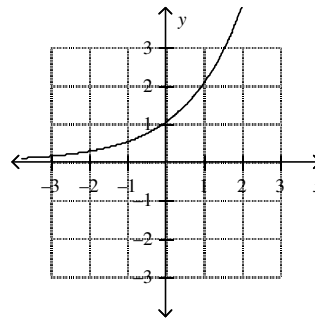
translation 1 unit left and 3 units down

120. Given the function  $f(x) = x^3$ , and transformations:
- horizontal compression (decide 2 or  $\frac{1}{2}$ )
  - vertical stretch (decide 3 or  $\frac{1}{3}$ )
  - reflection in the  $x$ -axis
  - reflection in the  $y$ -axis
  - translation 3 units right and 4 units up

121. The graph of  $y = h(x)$  is shown.  
Evaluate  $h(2) + h(3)$ .



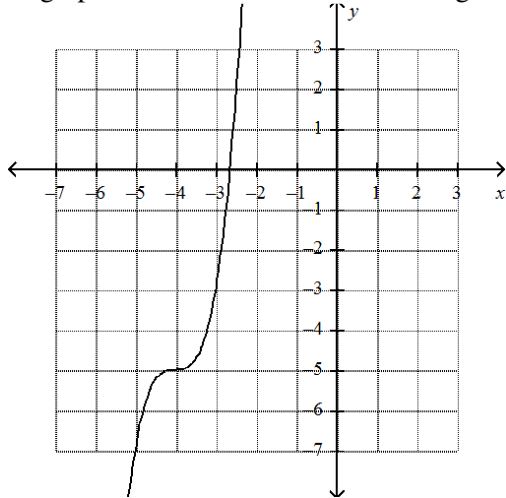
122. The graph of  $y = g(x)$  is shown. Evaluate  $g(1)$ .



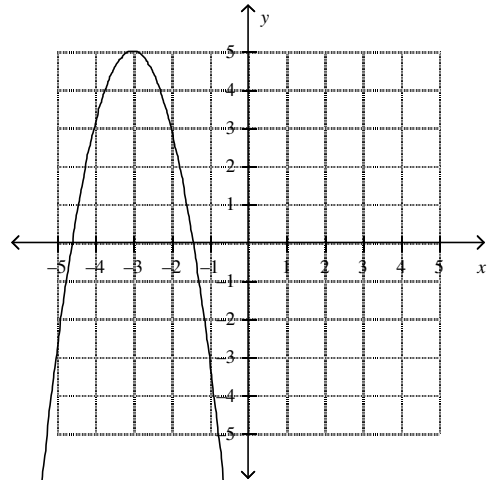
123. Evaluate  $f(x) = -4x^2 + 7$  for  $f(1) + f(-2)$ .

124. Evaluate  $f(x) = 7 - 9x$  for  $5f(-3) - 1$ .

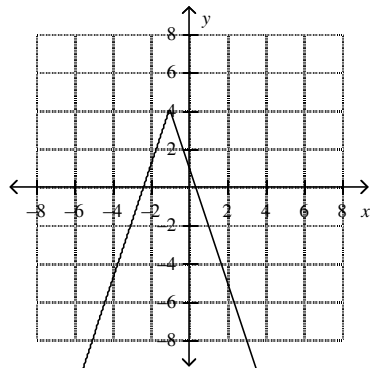
Sketch the graph of the inverse of the following  
125.



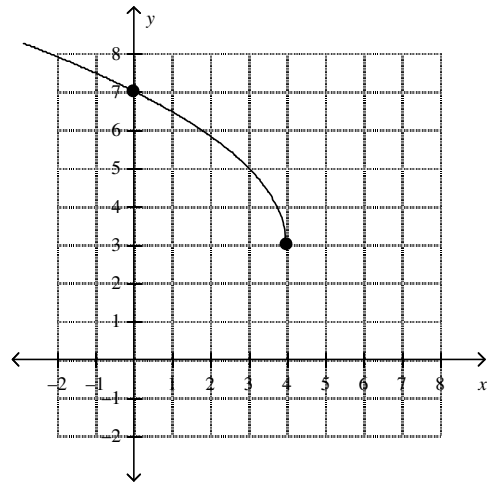
126.



127.



128.



Find the inverse, record in function notation, so that transformations (a, k, d, c) are easily visible

129.  $y = 2 - 3\sqrt{12 - 4x}$

130.  $f(x) = 3(x - 5)^3 - 9$



Find the inverse, record in function notation, simplify the answers.

131.  $f(x) = \frac{2\sqrt[3]{x} - 7}{4} + 5$

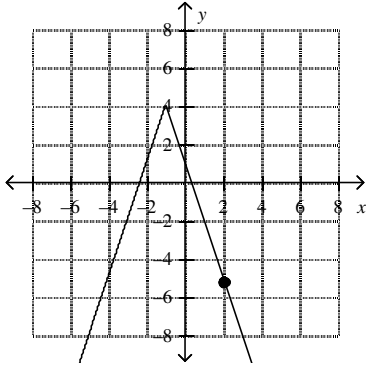
132.  $f(x) = \frac{-2x}{8 - 2x} + 1$

133.  $y = -(8 + 2x)^2 + 5$   
Restrict domain first to make the function on-to-one then find inverse

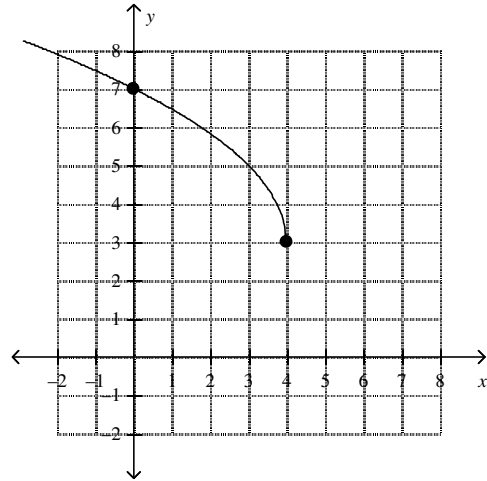
134.  $y = -2x^2 + 12x - 5$   
Restrict domain first to make the function on-to-one then find inverse

What is the equation of each of the following graphs?

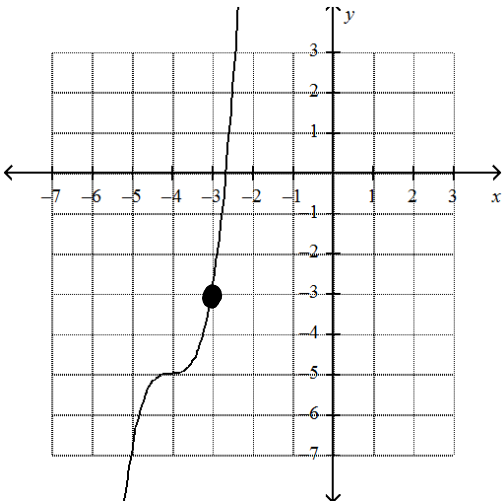
135.



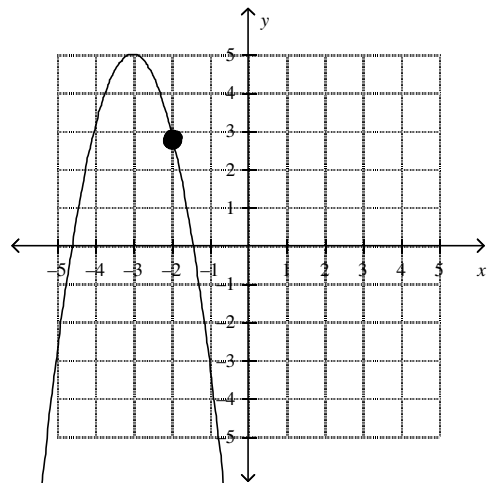
136.



137.



138.



**ASSIGNMENT Rotational Trig**

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For each of the following

- state the principal and related acute angles.
- name at least one more co-terminal angle
- predict the sign (positive or negative) of all primary trig ratios for this angle

139.  $-260^\circ$

140.  $590^\circ$

Find the exact values for the following (no calculators! – use special triangles and unit circle points)

141.  $\sin 135^\circ$

142.  $\sin 240^\circ$

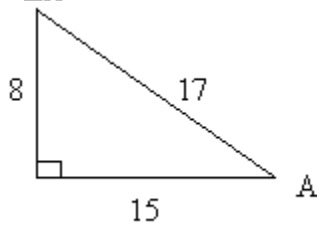
143.  $\tan 300^\circ$

144.  $\cos 315^\circ$

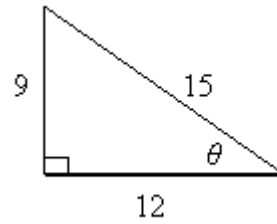
145.  $2 \csc(-270^\circ) \cos 225^\circ$

146.  $5 \sec(-180^\circ) \sin 45^\circ$

147. Given the following triangle, state the  $\sec \angle A$  and  $\cot \angle A$ .



148. Given the following triangle, state the  $\csc \angle \theta$  and  $\cot \angle \theta$ .



Find all angles in first positive revolution,  $0^\circ \leq \theta \leq 360^\circ$  (no calculators! there will be many answers)

149.  $\sin \theta = \frac{-\sqrt{3}}{2}$

150.  $\tan \theta = -\sqrt{3}$

151.  $\cos \theta = 0$

152.  $\cos \theta = -\frac{\sqrt{2}}{2}$

153.  $\tan \theta = -1$

154.  $\sin \theta = -1$

155. If  $\csc \theta = -\frac{8}{3}$  find two possible answers for  $\tan \theta$ .

156. If  $\sec \theta = -\frac{6}{5}$  find two possible answers for  $\tan \theta$ .

157. If point P(2, -7)  
a. find all three secondary trig ratios for the principal angle with point P on the terminal arm.  
b. find the principal angle

158. If point P(-3,5)  
a. find all three secondary trig ratios for the principal angle with point P on the terminal arm.  
b. find the principal angle

Find  $\theta$  in standard position,  $0^\circ \leq \theta \leq 360^\circ$ . (can use calculators, there will be many answers)

159.  $\cos \theta = -0.74$

160.  $\tan \theta = -0.74$

161.  $\sin \theta = -0.45$

162.  $\cos \theta = +0.75$

163.  $\sec \theta = 3$

164.  $\csc \theta = 5$