

**Accelerated Geom/Alg 2**  
**Exponentials and Logarithms Review Sheet**

Name: key  
 Date: \_\_\_\_\_ Block: \_\_\_\_\_

Graph the following functions:

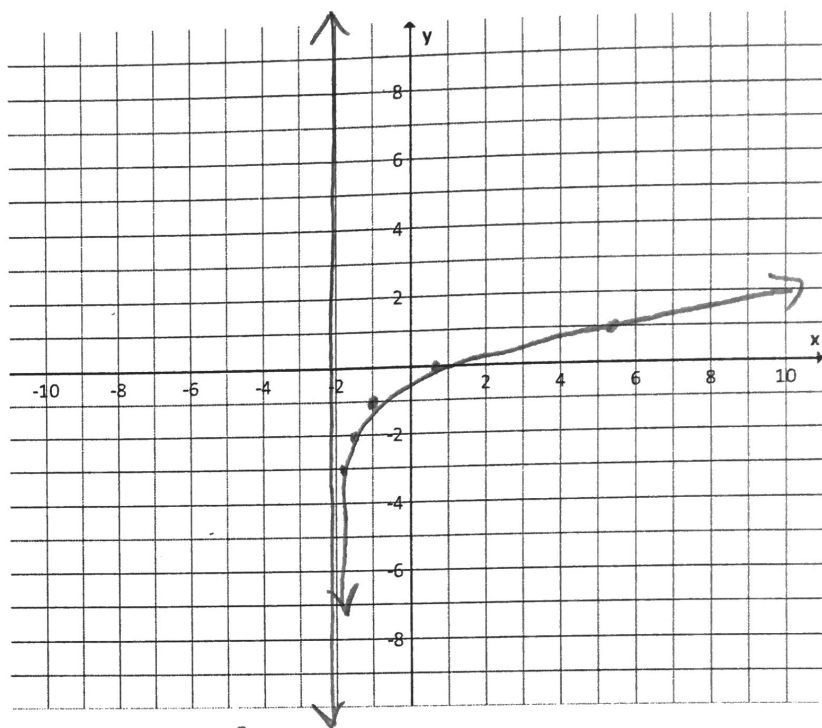
1.  $y = \ln(x+2) - 1$

Parent:

Transformation:

x	y
.135	-2
.368	-1
1	0
2.718	1
7.389	2

x-2	y-1
-1.865	-3
-1.632	-2
-1	-1
.718	0
5.389	1



Domain:  $(-2, \infty)$  Range:  $(-\infty, \infty)$  Asymptote:  $x = -2$

End Behavior:  $x \rightarrow -2, f(x) \rightarrow -\infty$       $x \rightarrow \infty, f(x) \rightarrow \infty$

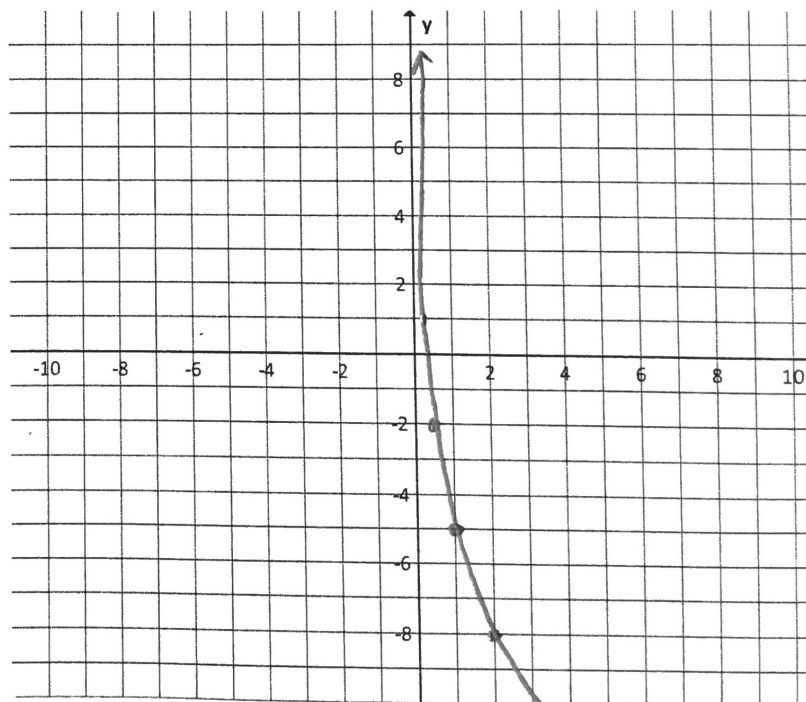
2.  $y = 3 \log_{\frac{1}{2}} x - 5$

Parent:

Transformation:

x	y
4	-2
2	-1
1	0
$\frac{1}{2}$	1
$\frac{1}{4}$	2

x	$3y-5$
4	-11
2	-8
1	-5
$\frac{1}{2}$	-2
$\frac{1}{4}$	1



Domain:  $(0, \infty)$  Range:  $(-\infty, \infty)$  Asymptote:  $x = 0$

End Behavior:  $x \rightarrow 0, f(x) \rightarrow \infty$       $x \rightarrow \infty, f(x) \rightarrow -\infty$

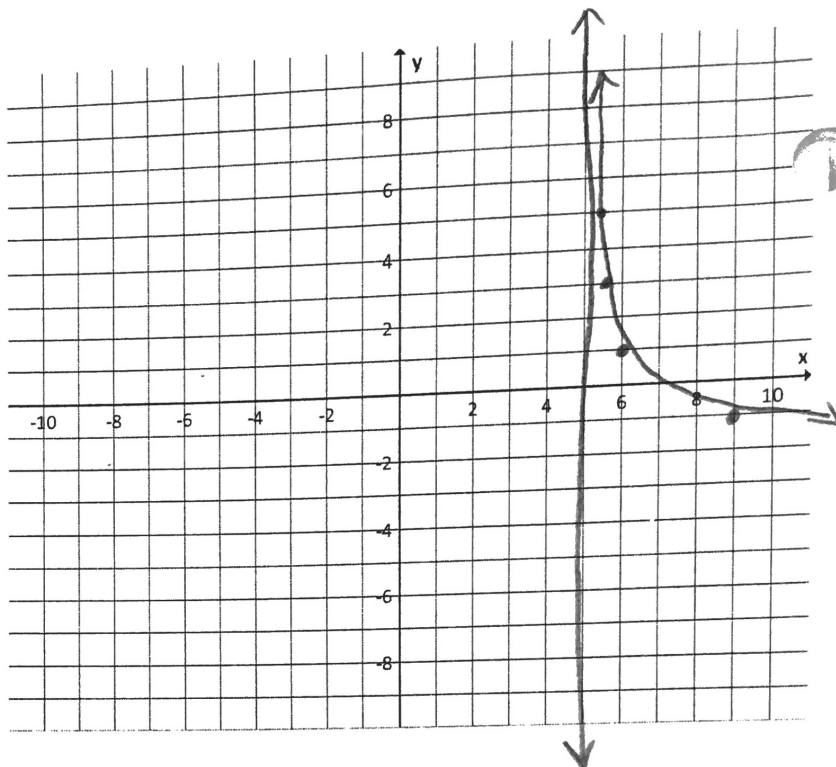
3.  $y = -2\log_4(x-5)+1$

Parent:

Transformation:

x	y
$1/16$	-2
$1/4$	-1
1	0
4	1
16	2

$x+5$	$-2y+1$
$5\frac{1}{16}$	5
5.25	3
6	1
9	-1
21	-3



Domain:  $(5, \infty)$  Range:  $(-\infty, \infty)$  Asymptote:  $x = 5$

End Behavior:  $x \rightarrow 5, f(x) \rightarrow \infty$   $x \rightarrow \infty, f(x) \rightarrow -\infty$

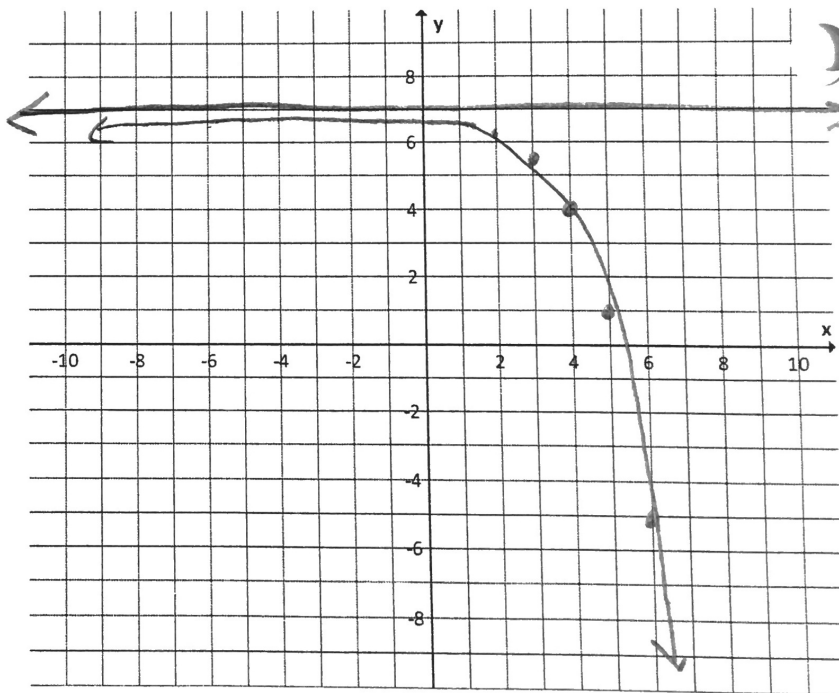
4.  $f(x) = -3 * 2^{x-4} + 7$

Parent:

Transformation:

x	y
-2	$1/4$
-1	$1/2$
0	1
1	2
2	4

$x+4$	$-3y+7$
2	6.25
3	5.5
4	4
5	1
6	-5



Domain:  $(-\infty, \infty)$  Range:  $(-\infty, 7)$  Asymptote:  $y = 7$

End Behavior:  $x \rightarrow -\infty, f(x) \rightarrow 7$   $x \rightarrow \infty, f(x) \rightarrow -\infty$

$$5) a) \ln \frac{x}{3y}$$

$$b) \log_5 x^5 y$$

$$c) \log_4 \frac{64}{y^6}$$

$$d) \log_4 \frac{8x}{y^2}$$

$$e) \log \frac{32a^3}{16b^5}$$

$$\log \frac{2a^3}{b^5}$$

$$6) a) 6 \log_2 x + 3 \log_2 y \quad b) 5 \log x - 30 \log y$$

OR

$$3(2 \log_2 x + \log_2 y)$$

OR

$$5(\log x - 6 \log y)$$

$$c) \log_3 x \log_3 y + 2 \log_3 z \quad d) \log_8 x + \log_8 y - \log_8 6$$

$$e) \log_4 16 + 3 \log_4 x + 2 \log_4 y - 4 \log_4 z$$

$$f) \log_2 5 + \frac{1}{2} \log_2 x$$

$$7) a) \log \frac{x}{3} = 2$$

$$10^2 = \frac{x}{3}$$

$$100 = \frac{x}{3}$$

$$300 = x$$

$$b) 3e^{5-x} = 18$$

$$e^{5-x} = 6$$

$$\ln 6 = 5 - x$$

$$1.792 = 5 - x$$

$$-3.208 = -x$$

$$3.208 = x$$

$$c) \log_3 \frac{x+5}{4} = 1$$

$$3^1 = \frac{x+5}{4}$$

$$3 = \frac{x+5}{4}$$

$$12 = x + 5$$

$$7 = x$$

$$d) 3^{x+7} = 81$$

$$\log_3 81 = x + 7$$

$$4 = x + 7$$

$$-3 = x$$

$$e) \log_4 (x^2 - 9x - 10) = \log_4 80$$

$$x^2 - 9x - 10 = 80$$

$$x^2 - 9x - 90 = 0$$

$$(x-15)(x+6) = 0$$

$$x = 15 \quad x = -6 \text{ is extraneous}$$

$$f) \log_7(-10x) = 1$$

$$7^1 = -10x$$

$$7 = -10x$$

$$\frac{-7}{10} = x$$

$$g) \log_5 \frac{x}{x+6} = \log_5 39$$

$$\frac{x}{x+6} = 39$$

$$x = 39x + 234$$

$$-38x = 234$$

$$x = -6.158$$

no solution

$$h) \log(x^2 + 3x) = 1$$

$$10^1 = x^2 + 3x$$

$$10 = x^2 + 3x$$

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

$$0 = (x+5)(x-2)$$

$$x = -5, x = 2$$

is ext.

$$i) \log_5 \frac{x^2 - 5}{4} = 1$$

$$5^1 = \frac{x^2 - 5}{4}$$

$$20 = x^2 - 5$$

$$25 = x^2$$

$$\pm 5 = x$$

$$j) \log_9(x+6) = 3$$

$$9^3 = x+6$$

$$729 = x+6$$

$$723 = x$$

$$k) \log_7(x-7) = -2$$

$$7^{-2} = x-7$$

$$\frac{1}{49} = x-7$$

$$7\frac{1}{49} = x$$

$$l) -2(4)^{2x-1} = -22$$

$$4^{2x-1} = 11$$

$$\log_4 11 = 2x-1$$

$$1.730 = 2x-1$$

$$2.730 = 2x$$

$$1.365 = x$$

$$m) e^{x-7} = 6$$

$$\ln 6 = x-7$$

$$1.792 = x-7$$

$$8.792 = x$$

$$n) 3x-1 = 4+x$$

$$2x = 5$$

$$x = 2.5$$

$$\textcircled{8} f(x) = 25 (\sqrt[4]{2})^x \\ = 25 (1.189)^x$$

$$r = .189 \text{ or } 18.9\%$$

$$\textcircled{9} 640 = 40(a)^x$$

$$16 = a^x \\ 4 = x$$

$$\textcircled{10} (\sqrt[4]{16384})^4$$

$$256$$

$$\textcircled{11}$$

$$216^{-2/3}$$

$$\frac{1}{(\sqrt[3]{216})^2}$$

$$\frac{1}{6^2}$$

$$\frac{1}{36}$$

$$\textcircled{12} (\sqrt[3]{2x+5})^4 = 2401$$

$$\sqrt[3]{2x+5} = 7$$

$$2x+5 = 343$$

$$2x = 338$$

$$x = 169$$

$$\textcircled{13} (\sqrt[3]{x-6})^5 = 59049$$

$$\sqrt[3]{x-6} = 9$$

$$x-6 = 729$$

$$x = 735$$