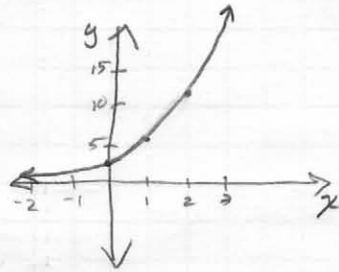


ALG 2 chapter 7 Summary - classwork Answer Key

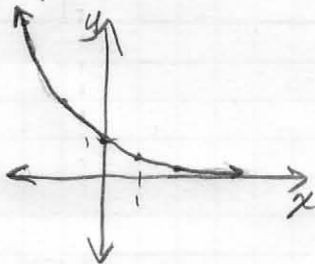
1) a) Exponential Growth (growth rate > 1)



x	$y = 3(2)^x$
-3	$3(2)^{-3} = \frac{3}{8}$
-2	$3(2)^{-2} = \frac{3}{4}$
-1	$3(2)^{-1} = \frac{3}{2}$
0	$3(2)^0 = 3$
1	$3(2)^1 = 6$
2	$3(2)^2 = 12$
3	$3(2)^3 = 24$

asymptote at $y=0$
(graph never reaches the x-axis)

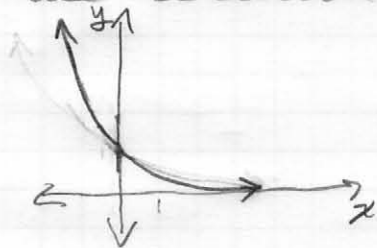
b) Exponential Decay ($0 < \text{growth rate} < 1$)



x	$y = (\frac{1}{2})^x$
-2	$(\frac{1}{2})^{-2} = 4$
-1	$(\frac{1}{2})^{-1} = 2$
0	$(\frac{1}{2})^0 = 1$
1	$(\frac{1}{2})^1 = \frac{1}{2}$
2	$(\frac{1}{2})^2 = \frac{1}{4}$

asymptote at $y=0$

c) Exponential Decay (negative exponent on e)
use a calculator to see Graph:



asymptote at $y=0$

- 2) a) 1.02 growth factor
b) .83 decay factor
c) 1.0075 growth factor

3) $A(5) = 4500e^{.035(5)} = 5360.61$ \$5,360.61

4) $A(3) = 3000(1-.23)^3 = 1369.6$ \$1,369.60

5) a) $\log_3 y = x$ b) $\log_4 2 = \frac{1}{2}$ c) $\log_{\frac{1}{2}} 8 = -3$

6) a) $8^{15} = x$ b) $2^1 = 2$ c) $(\frac{1}{4})^{-2} = 16$

ALG 2 chapter 7 summary - classwork KEY (CONT'D)

7) a) $\log_{10} 1000 = 3$ because $10^3 = 1000$

b) $\log_3 \frac{1}{27} = -3$ because $3^{-3} = \frac{1}{27}$

c) $\log_9 27 = \frac{3}{2}$ because $9^{\frac{3}{2}} = 27$

d) $\ln e = 1$ because $e^1 = e$

8) a) $y = \log_3 x$ is inverse of $y = 3^x$

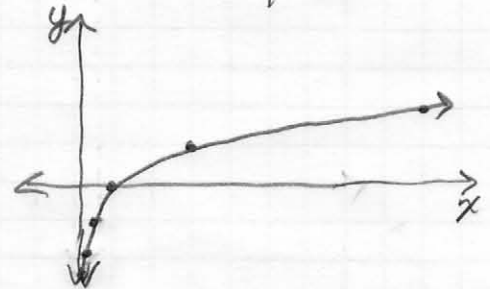
$y = 3^x$:

x	y = 3 ^x
-2	3 ⁻² = $\frac{1}{9}$
-1	3 ⁻¹ = $\frac{1}{3}$
0	3 ⁰ = 1
1	3 ¹ = 3
2	3 ² = 9

$y = \log_3 x \Rightarrow$

x	y
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
3	1
9	2

(Reverse the pairs)



b) $y = \log_2 x$ is inverse of $y = 2^x$

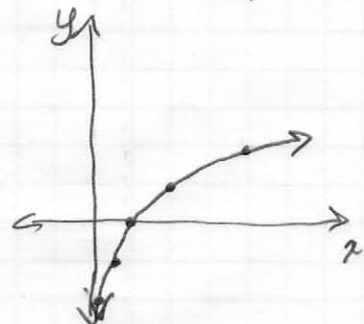
$y = 2^x$:

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

$y = \log_2 x \Rightarrow$

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

(Reverse the pairs)



9) a) $\frac{\log 12}{\log 3} = 2.26$

b) $\frac{\log 7.18}{\log 1.3} = 7.51$

c) $\frac{\log 79}{\log \frac{2}{3}} = -10.78$

b)

ALG 2 Chapter 7 Summary- Classwork Key (cont'd 2)

10) a) $2 \ln(3x-4) = 7$

Divide by 2:

$$\ln(3x-4) = \frac{7}{2}$$

Rewrite as exponential:

$$e^{\frac{7}{2}} = 3x-4$$

Subtract -4:

$$e^{\frac{7}{2}} + 4 = 3x$$

Divide by 3:

$$\frac{e^{\frac{7}{2}} + 4}{3} = x$$

Simplify with calculator & Round:

$$\boxed{x = 12.37}$$

check answer in original equation. (Rounding will make it close but not exact.)

b) $e^{x+6} + 5 = 1$

Subtract 5:

$$e^{x+6} = -4 \quad (\text{do you see a problem?!})$$

Rewrite as a logarithm:

$$\ln(-4) = x+6$$

NO SOLUTION. Domain of logarithm

does not include negative numbers (or zero).

c) $4^x - 5 = 12 \Rightarrow 4^x = 17 \Rightarrow \log_4 17 = x \Rightarrow \boxed{x = 2.04}$

d) $\log(x-25) = 2 \Rightarrow 10^2 = x-25 \Rightarrow \boxed{125 = x}$