

Name: Answers

Date: _____

Homework: Exponential Functions

Honors PreCalculus

Textbook Pages 284-286

Problems 33-40 all, 46-49, 56, 87, 89

33) (reflected over y-axis)

B

34) (shifted right 1)

F

35) (reflected over x+y axes)

D

36) (reflected over x-axis
shift up 1)

H

37) A

38) (reflected over x-axis)

C

39) (shift down 1)

E

40) (reflected over y-axis,
shift left 1)

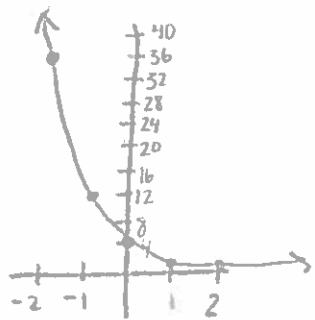
G

46) $y = 4\left(\frac{1}{3}\right)^x$ Vertical stretch of 4

$y = \frac{1}{3}^x$

X	Y
-2	9
-1	3
0	1
1	1/3
2	1/9

X	4Y
-2	36
-1	12
0	4
1	4/3
2	4/9



D: $(-\infty, \infty)$
R: $(0, \infty)$
HA: $y=0$

47) $f(x) = 3^{-x} - 2$

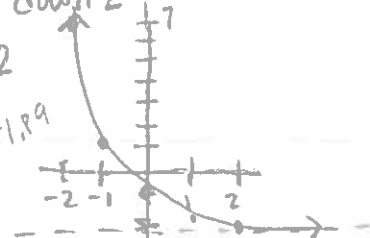
$y = 3^x$

X	Y
-2	1/9
-1	1/3
0	1
1	3
2	9

$-x$ $y-2$

X	Y
2	-17/9
1	-5/3
0	-1
-1	1
-2	7

reflect over y-axis
down 2



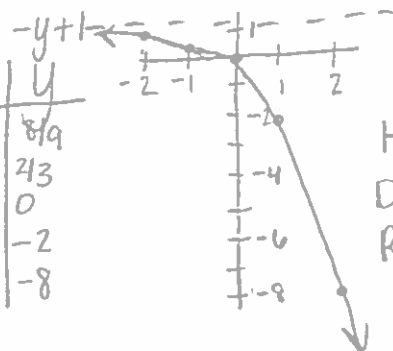
HA: $y=2$
D: $(-\infty, \infty)$
R: $(-2, \infty)$

48) $f(x) = -3^x + 1$ reflect over x-axis
up 1

$y = 3^x$

X	Y
-2	1/9
-1	1/3
0	1
1	3
2	9

X	Y
-2	8/9
-1	2/3
0	0
1	-2
2	-8



HA: $y=1$
D: $(-\infty, \infty)$
R: $(-\infty, 1)$

49) $f(x) = 2 + 4^{x-1}$

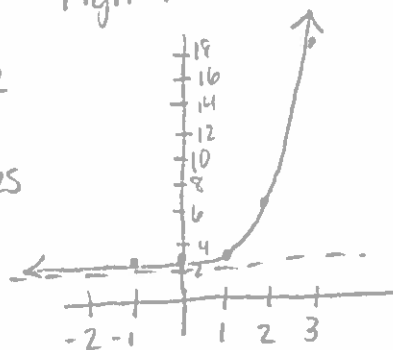
up 2
right 1

$y = 4^x$

X	Y
-2	1/16
-1	1/4
0	1
1	4
2	16

$x+1$ $y+2$

X	Y
-1	2.0625
0	2.25
1	3
2	6
3	18



HA: $y=2$
D: $(-\infty, \infty)$
R: $(2, \infty)$

1. Find an exponential model in form $y = ab^x$ for which $f(2) = 6$ and $f(8) = 3072$
- $\begin{matrix} x & y & & x & y \\ \downarrow & \downarrow & & \downarrow & \downarrow \\ (2, 6) & & & (8, 3072) \end{matrix}$

$y = ab^x$
 $\frac{6}{b^2} = \frac{ab^2}{b^2}$
 $\frac{6}{b^2} = a$
 $\frac{6}{2.828^2} = a$
 $.75 = a$

$3072 = ab^8$
 $3072 = (\frac{6}{b^2})b^8$
 $3072 = 6b^6$
 $\frac{3072}{6} = \frac{6b^6}{6}$
 $512 = b^6$
 $\sqrt[6]{512} = \sqrt[6]{b^6}$
 $2.828 = b$

$y = ab^x$
 $y = .75(2.828)^x$

2. An online store begins selling a new type of basketball shoe. In week 2, 60 pairs of shoes were sold. In week 4, the store sold 240 pairs. Write an exponential model ($y = ab^x$) that relates the number of shoes (in pairs) sold to the week number.

- a) How many did they originally sell? $x=0$

$y = 15(2)^0$ $y = 15$ pairs

- b) What was the growth factor?

$b = 2$

- c) What was the % increase?

$1+r = b$ $r = 1$
 $1+r = 2$ 100%

- d) If the trend continues, how many shoes can they expect to sell in week 6?

$y = 15(2)^6$
 $y = 960$ pairs

$y = ab^x$
 $60 = ab^2$ $240 = ab^4$
 $\frac{60}{b^2} = \frac{ab^2}{b^2}$ $240 = (\frac{60}{b^2})b^4$
 $\frac{60}{b^2} = a$ $240 = \frac{60}{b^2}b^4$
 $\frac{60}{2^2} = a$ $240 = \frac{60}{4}b^2$
 $15 = a$ $4 = b^2$
 $2 = b$

$y = 15(2)^x$

3. Determine which ordered pairs are solutions to the given function. $y = -3(\frac{1}{2})^x$

A) (0, -3)
 $-3 = -3(\frac{1}{2})^0$
 $-3 = -3$
 \checkmark

B) (2, -0.75)
 $-0.75 = -3(\frac{1}{2})^2$
 $-0.75 = -0.75$
 \checkmark

C) (-1, 6)
 $6 = -3(\frac{1}{2})^{-1}$
 $6 \neq -6$

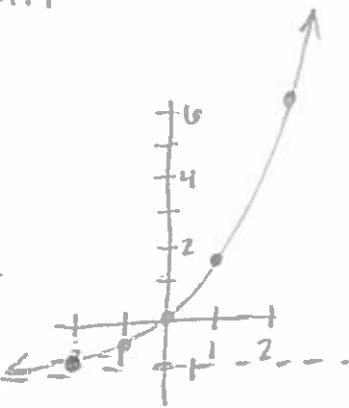
D) (-2, -12)
 $-12 = -3(\frac{1}{2})^{-2}$
 $-12 = -12$
 \checkmark

56) $f(x) = e^x - 1$ down 1

$y = e^x$

X	Y
-2	.135
-1	.368
0	1
1	2.718
2	7.389

X	Y
-2	-.865
-1	-.632
0	0
1	1.718
2	6.389



HA: $y = -1$

D: $(-\infty, \infty)$

R: $(-1, \infty)$

87) choose 2 points on the function

$(0, -1)$ $(1, -b)$

$y = ab^x$

$-1 = ab^0$

$-1 = a$

$-b = ab^1$

$-b = (-1)b$

$b = b$

$y = -1(b)^x$

89) $(0, 3), (1, 5)$, HA: $y = 2$ ← means the graph must have been shifted up 2

$y = ab^x + 2$

$3 = ab^0 + 2$

$1 = ab^0$

$1 = a$

$5 = ab^1 + 2$

$3 = ab^1$

$3 = b$

$y = 1(3)^x + 2$

$y = 3^x + 2$

