Algebra 1: 5.1 – 5.3 Test Review **Name** _____ **Period**____

Simple: $A = P + (Pr)t$ Compound: $A = P(1+r)^t$

$A = 1200 + (1200 \cdot 0.05)t$ $A = 1200(1.05)^t$

1. Adil has \$1,200 to deposit into an account with an interest rate of 5%. Use the simple and compound interest formulas to complete the table. **Round to the NEAREST CENT.**

$P = 1200$

$r = 5/100 = 0.05$

Quantity	Time	Simple Interest Balance	Compound Interest Balance
Units	years	dollars	dollars
Expression	t	$1200 + 60t$	$1200(1.05)^t$
	0	\$1200	\$1200
	3	\$1380	\$1389.15
	10	\$1800	\$1954.67
	20	\$2400	\$3183.96

a. If it costs \$300.00 to have your savings in a compound interest account, would it make sense to use that account if you were only going to save your money for 10 years? $1954.67 - 300 = \$1654.67$

< 1800 so No

b. What about for 20 years?

$3183.96 - 300 = \$2883.96$

> 2400 so Yes

2. Bryce City has a population of 26,000. Its population is increasing at a rate of 3.5%.

- Write a function to represent the population over time. $P(t) = P(1+r)^t$
- Determine the population after a given number of years. **Round to the nearest WHOLE NUMBER.** $P = 26000$ $r = 0.035$ $P(t) = 26000(1.035)^t$

a. 2 years

$P(2) = 26000(1.035)^2$

$= \$27852$

b. 10 years

$P(10) = 26000(1.035)^{10}$

$= \$36,676$

c. 20 years

$P(20) = 26000(1.035)^{20}$

$= \$51,735$

3. Khanyaville has a population of 85,000. Its population is decreasing at a rate of 2.5%.

- Write a function to represent the population over time. $P(t) = P(1-r)^t$
- Determine the population after a given number of years. **Round to the nearest WHOLE NUMBER.** $P = 85000$ $r = 0.025$ $P(t) = 85000(1-0.025)^t$

a. 8 years

$P(8) = 85000(0.975)^8$

$= \$69,415$

b. 5 years

$P(5) = 85000(0.975)^5$

$= \$74,893$

c. 16 years

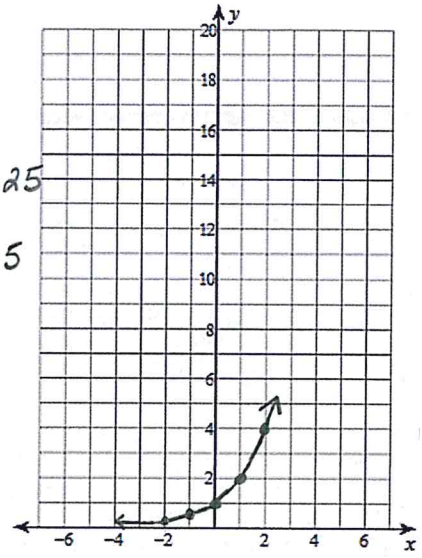
$P(16) = 85000(0.975)^{16}$

$= \$56,688$

Complete the table. Graph each exponential function. Identify the y-intercept, asymptote, domain, and range. **Type each expression into the calculator exactly as it is written, replacing x with its value.**

4. $y = 2^x$

x	y	
-2	$\frac{1}{4}$	0.25
-1	$\frac{1}{2}$	0.5
0	1	
1	2	
2	4	

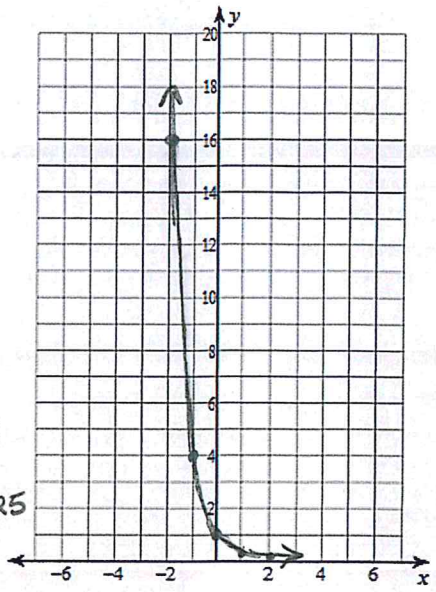


y-intercept: $(0,1)$ asymptote: $y=0$

domain: All real numbers range: $y>0$

5. $y = \left(\frac{1}{4}\right)^x$

x	y	
-2	16	
-1	4	
0	1	
1	$\frac{1}{4}$	0.25
2	$\frac{1}{16}$	0.0625

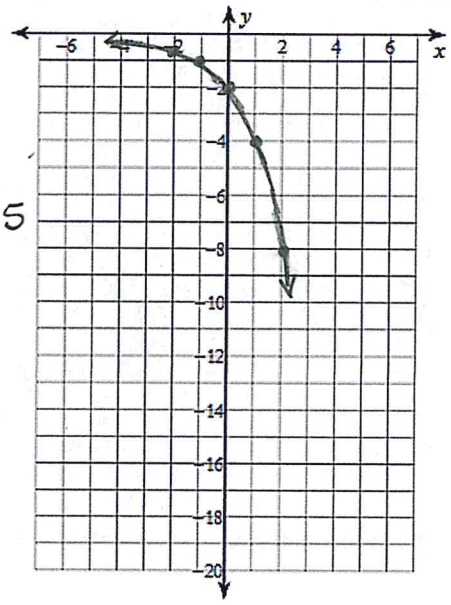


y-intercept: $(0,1)$ asymptote: $y=0$

domain: All real numbers range: $y>0$

6. $y = -2 \cdot 2^x$

x	y	
-2	$-\frac{1}{2}$	-0.5
-1	-1	
0	-2	
1	-4	
2	-8	

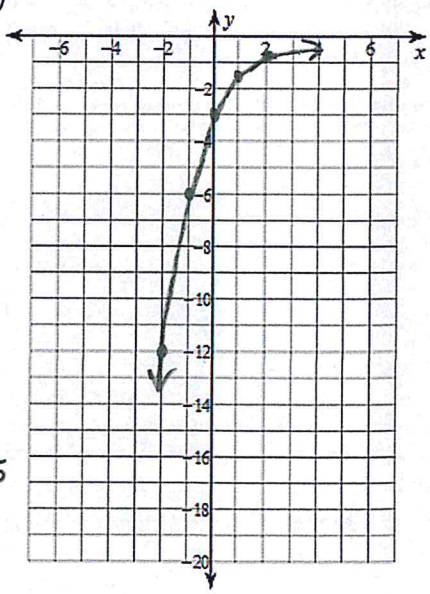


y-intercept: $(0,-2)$ asymptote: $y=0$

domain: All real numbers range: $y<0$

7. $y = -3 \cdot \left(\frac{1}{2}\right)^x$

x	y	
-2	-12	
-1	-6	
0	-3	
1	$-\frac{3}{2}$	-1.5
2	$-\frac{3}{4}$	-0.75



y-intercept: $(0,-3)$ asymptote: $y=0$

domain: All real numbers range: $y<0$

8. Write the equation of each new function $g(x)$ after the translation.

a. $f(x) = -8x$ after a translation **6 units to the right** (−) HT

$g(x) = -8(x-6)$

b. $f(x) = 4^x$ after a translation **3 units up** (+) VT

$g(x) = 4^x + 3$

c. $f(x) = 2x^2$ after a translation **2 units left** (+) HT

$g(x) = 2(x+2)^2$

d. $f(x) = 4x$ after a translation **7 units down** (−) VT

$g(x) = 4x - 7$

e. $f(x) = \left(\frac{1}{2}\right)^x$ after a translation **4 units to the right** (−) HT

$g(x) = \left(\frac{1}{2}\right)^{(x-4)}$

f. $f(x) = x^2$ after a translation **4 units down** (−) VT

$g(x) = x^2 - 4$

9. Describe each graph in relation to its basic function, i.e. vertical translation up 8 units.

a. Compare the basic function $f(x) = x^2$ to $g(x) = (x+2)^2$

Horizontal translation left 2 units

b. Compare the basic function $f(x) = b^x$ to $g(x) = b^x + 1$

Vertical translation up 1 unit

c. Compare the basic function $f(x) = 2^x$ to $g(x) = 2^{(x-7)}$

Horizontal translation right 7 units

d. Compare the basic function $f(x) = 4x^2$ to $g(x) = 4(x-9)^2$

Horizontal translation right 9 units

e. Compare the basic function $f(x) = b^x$ to $g(x) = b^{(x-2)}$

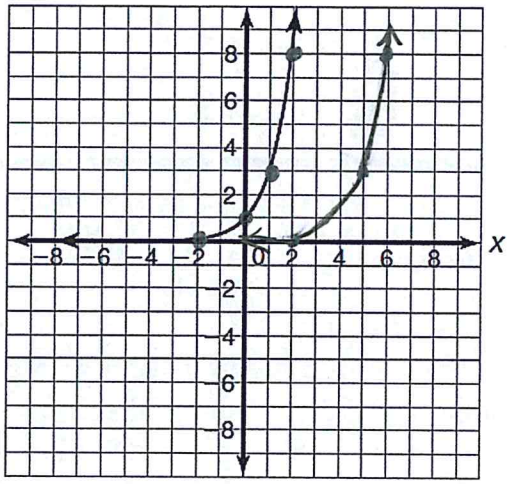
Horizontal translation right 2 units

f. Compare the basic function $f(x) = \left(\frac{1}{2}\right)^x$ to $g(x) = \left(\frac{1}{2}\right)^{(x+4)}$

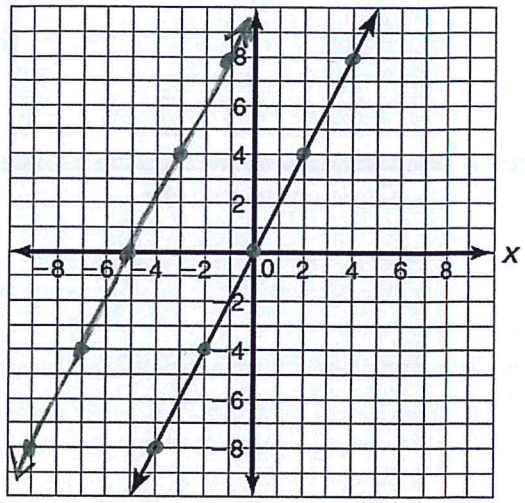
Horizontal translation left 4 units

10. Each coordinate plane shows the graph of the basic function. Sketch the graph of $g(x)$.

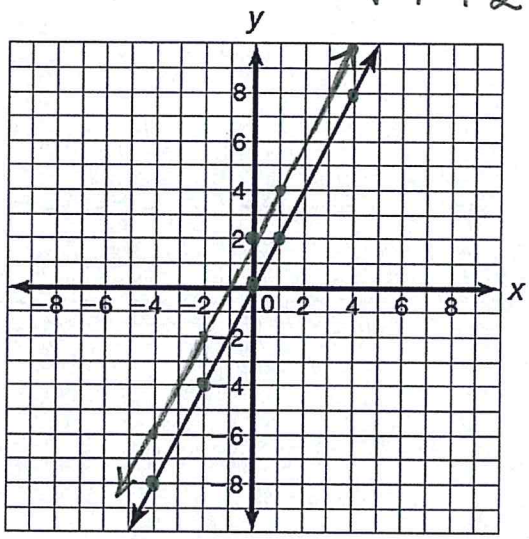
a. $g(x) = b^{(x-4)}$ HT → 4



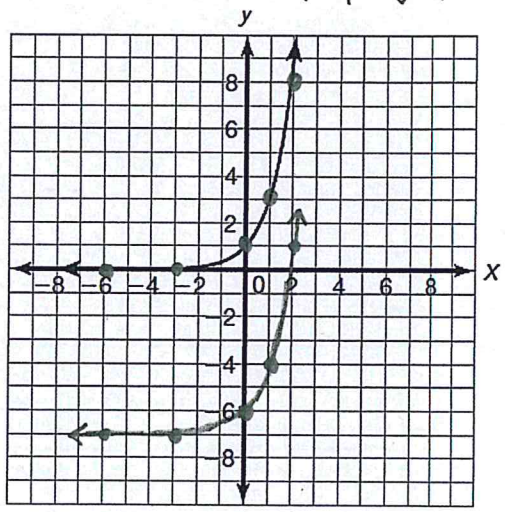
b. $g(x) = f(x+5)$ HT ← 5



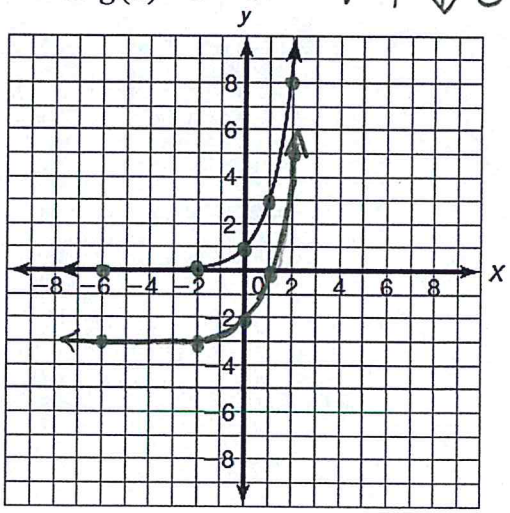
c. $g(x) = f(x)+2$ VT ↑ 2



d. $g(x) = b^x - 7$ VT ↓ 7



e. $g(x) = b^x - 3$ VT ↓ 3



f. $g(x) = b^{(x-3)}$ HT → 3