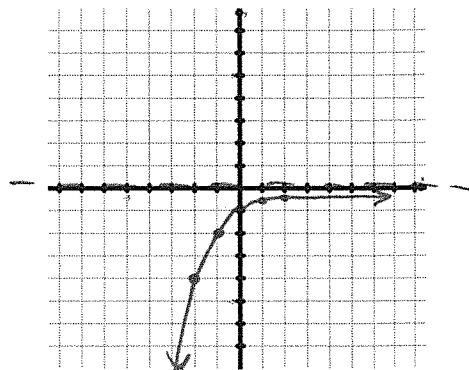


Part 1: No calculator. Show all work for full credit.

1. Graph the function $y = -\left(\frac{1}{2}\right)^x$.

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



equation of asymptote? $y = 0$

2. Graph $y = 2(x-3)^2$ by using transformations.

list of transformations: *vertical stretch x2, right 3*

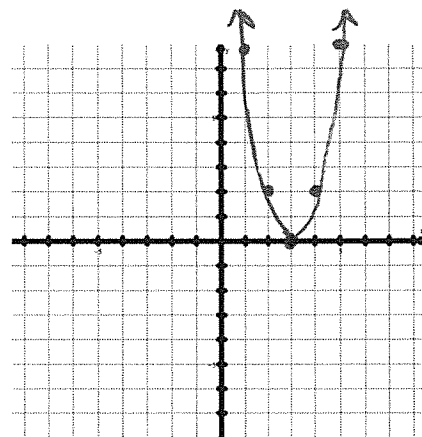
parent function:

$$y = x^2$$

x	y
-2	4
-1	1
0	0
1	1
2	4

final table:

x	y
1	8
2	2
3	0
4	2
5	8



3. Solve the formula for the indicated letter.

a. $I = Prt$, for P

$$P = \frac{I}{rt}$$

d. $s = \sqrt{\frac{A}{m}}$, for A

$$m \cdot s^2 = \frac{A}{m} \cdot m$$

$$A = ms^2$$

b. $P = 2l + 2w$, for l

$$\frac{2l}{2} = \frac{P - 2w}{2}$$

$$l = \frac{P - 2w}{2}$$

e. $V = \pi r^2 h$, for h

$$h = \frac{V}{\pi r^2}$$

c. $3V = \frac{4}{3}ar^3$, for a

$$\frac{3V}{4r^3} = \frac{4ar^3}{4r^3}$$

$$a = \frac{3V}{4r^3}$$

f. $F = \frac{Gm_1m_2}{r^2}$, for r

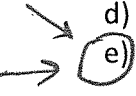
$$\frac{r^2 F}{F} = \frac{Gm_1m_2}{F}$$

$$r^2 = \frac{Gm_1m_2}{F}$$

$$r = \sqrt{\frac{Gm_1m_2}{F}}$$

4. Multiple choice. Which of the following is an accurate definition of the *standard deviation*?

- a) how spread out your data is
- b) the total deviations of your data points
- c) S_x after finding 1-var stats on the graphing calculator
- d) the distance every data point is from the mean
- e) the average distance your data points are away from the mean



5. Decide whether the points below show linear, quadratic, or exponential growth. Then write the equation that describes the pattern.

a.

x	-2	-1	0	1	2	3
y	8.1	6	3.9	1.8	-0.3	-2.4

Type of growth: linear Equation for growth: $y = -2.1x + 3.9$

b.

x	-2	-1	0	1
y	2	6	18	54

Type of growth: exponential $\times 3$ Equation for growth: $y = 18 \cdot 3^x$

6. Review! Simplify each rational expression, if possible.

a. $\frac{x^2 - 5x + 4}{x^2 - x - 12}$

$$\frac{\cancel{(x-4)}(x-1)}{\cancel{(x-4)}(x+3)}$$

$$\boxed{\frac{x-1}{x+3}}$$

b. $\frac{9x^2 - 1}{3x^2 + 14x - 5}$

$$\frac{\cancel{(3x-1)}(3x+1)}{\cancel{(3x-1)}(x+5)}$$

$$\boxed{\frac{3x+1}{x+5}}$$

Part 2: Graphing calculator OK. Show all work for full credit.

1. The population of the United States is growing at 1.3% per year. If we now have 310,000,000 people, find how many people we will have in the U.S. in 20 years.

$$y = 310,000,000 (1.013)^{20}$$

$$y = 401,375,261 \text{ people}$$

2. The amount of a 100-mg dose of a blood thinner decreases in your bloodstream at a rate of 11% per hour. Find the amount left in your bloodstream after 8 hours.

$$y = 100 (.89)^8$$

$$y = 39.37 \text{ mg}$$

3. You invest \$4,000 in the stock market, and make a return of 12% per year. How much will you have in 30 years?

$$y = 4000 (1.12)^{30}$$

$$y = \$119,839.69$$

4. Your company's sales growth is described by the function $y = 9300(1.36)^x$. By what percent growth is the sales changing every year?

$$1 + .36$$

↑
it's increasing
36% per year

5. For the following data, find the line of regression. Then use it to predict the value of y when x = 1.7.

x	-2	-1	0	1	2	3	4
y	4.3	8.0	11.4	15.5	19.2	23.6	28.1

Regression equation: $y = 3.94x + 11.79$ Predicted y-value: $y = 3.94(1.7) + 11.79 = 18.49$

6. For the following data, find the exponential regression equation. Then use it to predict the value of y when x = 1.7.

x	-2	-1	0	1	2
y	4	6	9	13	19

Regression equation: $y = 8.82 * 1.48^x$ Predicted y-value: $y = 8.82 * 1.48^{1.7} = 17.18$

7. Nineteen sales representatives of a company travel regularly to meet their clients. Each value represents the distance, in miles, that the representatives had to travel on a randomly selected day of the week.

11	29	6	33	14	21	18	17	22	38
31	22	27	19	22	23	26	39	34	

← note: one data set!

Summarize this data in a paragraph. You should have two measures of center, two measures of spread, and one description of shape.

mean: 23.79

median: 22

range: 33

standard deviation: 8.86

from calc

symmetric

from dot plot

The center is at around 22 (mean = 23.79, median = 22).

The data is somewhat spread out (range = 33, standard deviation = 8.86)

The data is quite symmetric.

