

For questions 1-8:

- Identify the table as linear, exponential, quadratic, or neither.
- If you identify the table as linear or exponential, write an equation.

1. exponential $y = \frac{-1}{2}(4)^n$

-3	-2	-1	0	1	2	3
$\frac{-1}{128}$	$\frac{-1}{32}$	$\frac{-1}{8}$	$\frac{-1}{2}$	-2	-8	-32

2. linear $y = -3x - 7$

-3	-2	-1	0	1	2	3
2	-1	-4	-7	-10	-13	-16

3. Quadratic $y = N/A$

-3	-2	-1	0	1	2	3
6	2	0	0	2	6	12

4. linear $y = 5x + 8$

-4	-3	-2	-1	0	1	2
-12	-7	-2	3	8	13	18

5. neither $y = N/A$

-5	-4	-3	-2	-1	0	1
8	7	6	5	4	3	4

6. exponential $y = \frac{1}{4}(4)^n$

-1	0	1	2	3	4	5
$\frac{1}{16}$	$\frac{1}{4}$	1	4	16	64	256

7. exponential $y = 3(\frac{1}{2})^n$

-5	-4	-3	-2	-1	0	1
96	48	24	12	6	3	$\frac{3}{2}$

8. Quadratic $y = N/A$

-3	-2	-1	0	1	2	3
19	9	3	1	3	9	19

9. My graduating class from PV in 1994 had 199 students. It seems that class sizes are increasing at around 2.5% every year.

- a. Which type of equation is best represents this situation? (Circle one) Linear **Exponential** Quadratic
b. Explain why you chose your answer to part "a". (Give key features from the word problem)

increasing by a %

- c. Write an equation to represent the situation. $y = 199(1.025)^t$
d. What will the graduating class be in 2015?

$$y = 199(1.025)^{21}$$
$$y = 334 \text{ or } 335$$

10. Billy was mad at his little brother Bobby for busting his iPod so he took Bobby's iPod Shuffle and threw it off the top of an 82-foot bridge with a velocity of 48 feet per second.

- a. Which type of equation is best represents this situation? (Circle one) Linear Exponential **Quadratic**
b. Explain why you chose your answer to part "a". (Give key features from the word problem)

velocity, throwing

- c. Write an equation to represent the situation. $y = -16x^2 + 48x + 82$

- d. What was the maximum height that the IPOD Shuffle reached?

$$x = \frac{-48}{2(-16)} = 1.5$$
$$y = -16(1.5)^2 + 48(1.5) + 82$$
$$= -36 + 72 + 82$$
$$= 118 \text{ feet}$$

11. Ever since Mrs. Ver Heecke "liked" it on Facebook, business at Yoga Pose has been doubling every month. If the business started with only 9 clients.

- a. Which type of equation is best represents this situation? (Circle one) Linear **Exponential** Quadratic
b. Explain why you chose your answer to part "a". (Give key features from the word problem)

Doubling

- c. Write an equation to represent the situation. $y = 9(2)^x$

- d. How many clients did they have in month 8?

$$y = 9(2)^8$$
$$y = 2304 \text{ clients}$$

12. Mark and Tony joined a movie service online. For a one-time membership fee, you can purchase and download as many movies as you'd like for one low price. So far, Tony has purchased 4 movies, and has spent \$38. Mark has purchased 7 movies and has spent \$57.50.

- a. Which type of equation is best represents this situation? (Circle one) **Linear** Exponential Quadratic
 b. Explain why you chose your answer to part "a". (Give key features from the word problem)

2 ordered pairs (4, 38) (7, 57.50)

c. Write an equation to represent the situation. $y = 6.50x + 12$

$$\frac{57.50 - 38}{7 - 4} = \frac{19.50}{3} = 6.50 \quad 38 = 4(6.5) + b$$

$$38 = 26 + b$$

$$12 = b$$

d. How much does the membership to the service cost? \$12

e. How much do they charge per movie? \$6.50

13. Jordan's mom got mad at him for missing curfew for the 3rd time. To teach him a lesson, she took him to the top of a 65-foot cliff and threw his keys with a velocity of 80 feet per second into the lake.

- a. Which type of equation is best represents this situation? (Circle one) Linear Exponential **Quadratic**
 b. Explain why you chose your answer to part "a". (Give key features from the word problem)

velocity, throwing

c. Write an equation to represent the situation. $y = -16x^2 + 80x + 65$

d. How long did it take for Jordan's keys to hit the water?

$$x = \frac{-80 \pm \sqrt{(80)^2 - 4(-16)(65)}}{2(-16)}$$

$$x = -.71 \quad x = 5.71$$

$$x = \frac{-80 \pm \sqrt{6400 + 4160}}{-32}$$

$$x = \frac{-80 \pm \sqrt{10560}}{-32}$$

14. If a 24-inch candle burns at a rate of 5% every hour, how tall will the candle be after 6 hours?

- a. Which type of equation is best represents this situation? (Circle one) Linear **Exponential** Quadratic

b. Explain why you chose your answer to part "a". (Give key features from the word problem)

burning at a rate of 5%. (decreasing)

c. Write an equation to represent the situation. $y = 24(1 - .05)^t$

d. Answer the question above.

$$y = 24(0.95)^6$$
$$y = 17.64 \text{ inches}$$

15. Sarah has been knocking 2 seconds off of her 400 meter run time every race. In her 11th race, she ran a time of 63 seconds.

- a. Which type of equation is best represents this situation? (Circle one) **Linear** Exponential Quadratic

b. Explain why you chose your answer to part "a". (Give key features from the word problem)

$m = -2$ (11, 63)
slope and one ordered pair

c. Write an equation to represent the situation. $y = -2x + 85$

$$63 = -2(11) + b$$

$$63 = -22 + b$$

$$85 = b$$

d. What was her original time for her 400 meters? 85 seconds

e. When will Sarah reach her goal of 57 seconds?

$$57 = -2x + 85$$

$$-28 = -2x$$

$$14 = x$$

races