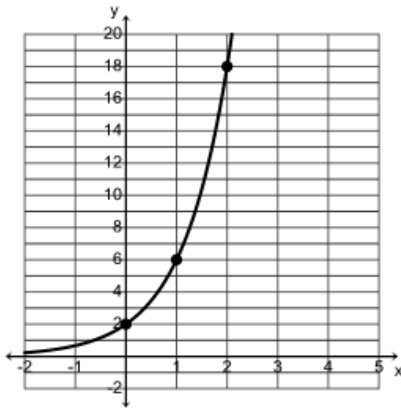


A2H Tabular Data & Average Rate of Change Worksheet

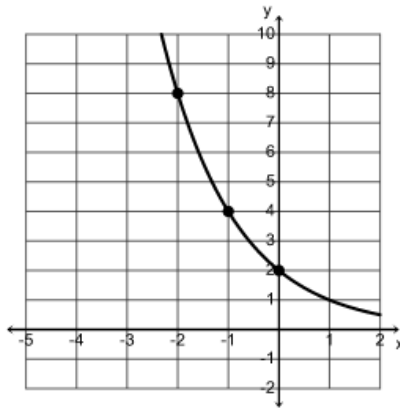
Determine the exponential equation, $f(x) = a \cdot b^x$, for each of the following graphs. State the domain and range

1. $f(x) =$



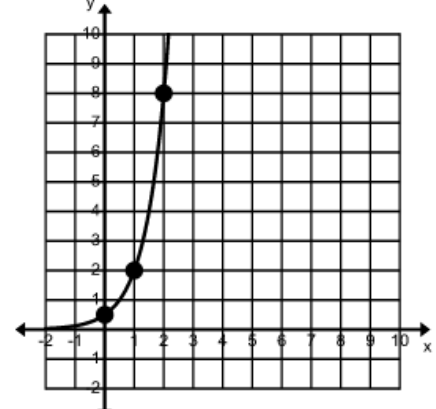
D: R:

2. $f(x) =$



D: R:

3. $f(x) =$



D: R:

Identify if the table represents a linear, quadratic, exponential, or log function. Explain your answer.

4.

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

5.

x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

6.

x	-3	-2	-1	0	1	2
y	30	20	12	6	2	0

7.

x	-4	-3	-2	-1	0
y	81	27	9	3	1

8.

x	-3	-2	-1	0	1	2	3
y	0	5	8	9	8	5	0

9.

x	-3	-2	-1	0	1	2	3
y	11	6	1	-4	-9	-14	-19

10.

Students in a science class study how long balloons stay inflated. Each day, the students record the number of balloons that are still inflated. The students determine that the data appear to be exponential.

Which table could represent their findings?

Ⓐ **Balloon Data**

Day	Balloons Remaining
1	26
2	18
3	10
4	2

Ⓒ **Balloon Data**

Day	Balloons Remaining
1	28
2	19
3	11
4	4

Ⓑ **Balloon Data**

Day	Balloons Remaining
1	30
2	15
3	4
4	2

Ⓓ **Balloon Data**

Day	Balloons Remaining
1	27
2	9
3	3
4	1

11. Find the average rate of change over the indicated interval.

a) $f(x) = -5x + 7$, $[-2, 3]$

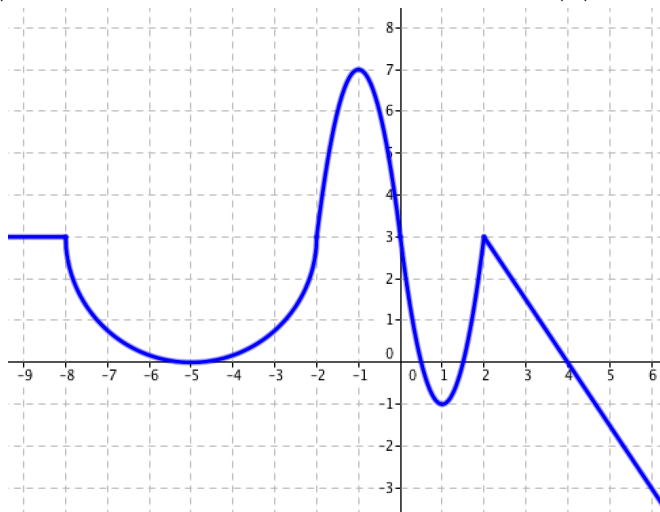
b) $f(x) = x^3 - x + 2$, $[\frac{1}{2}, 1]$

12. Sketch each function. Then determine if the average rate of change over the indicated interval is positive or negative. Explain.

a) $f(x) = -\sqrt{x+2}$, $[1, 9]$

b) $f(x) = 3^{x-4} - 1$, $[-3, -1]$

13. The graph of $f(x)$ is shown below. Over which interval does $f(x)$ have an average rate of -4?



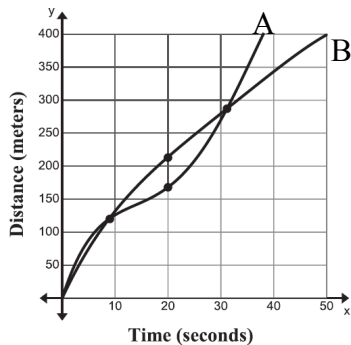
- a) $-1 < x < 1$
- b) $-5 < x < 1$
- c) $-2 < x < 4$
- d) $-8 < x < 2$

14. Over which interval does $g(x)$ have a positive average rate of change?

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
$g(x)$	0	2	6	7	5	3	0	-3	-5	-1	2

- a) $[-4, 3]$
- b) $[-3, 1]$
- c) $[-2, 3]$
- d) $[4, 5]$

15. Below is the graph and table for 2 runners running the 400-meter hurdles race.



Time	Runner A	Runner B
0	0	0
9	120	120
20	168	213
31	287	287

- a) Which runner has a faster average speed from 9 to 20 seconds?
- b) Which runner has a faster average speed from 20 to 31 seconds?
- c) Which runner has a faster average speed from 9 to 31 seconds?
- d) Which runner wins the race? How do you know?

Answers

1) $f(x) = 2 \cdot 3^x$ Domain: $(-\infty, \infty)$ Range: $(0, \infty)$

2) $f(x) = 2\left(\frac{1}{2}\right)^x$ Domain: $(-\infty, \infty)$ Range: $(0, \infty)$

3) $f(x) = \frac{1}{2} \cdot 4^x$ Domain: $(-\infty, \infty)$ Range: $(0, \infty)$

4) exponential

5) linear

6) quadratic

7) exponential

8) quadratic

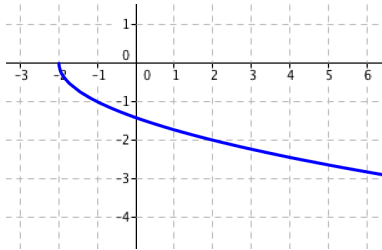
9) linear

10) D

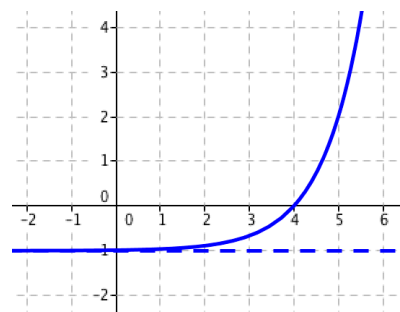
11) a. -5 b. $\frac{3}{4}$

12)

a) The average rate of change is negative because the graph of $f(x)$ is decreasing on the indicated interval.



b) The average rate of change is positive because the graph of $f(x)$ is increasing on the indicated interval.



13. A

14. D

15.

a) Runner B

b) Runner A

c) Neither

d) Runner A. Runner A runs 400 meters in less time than Runner B.