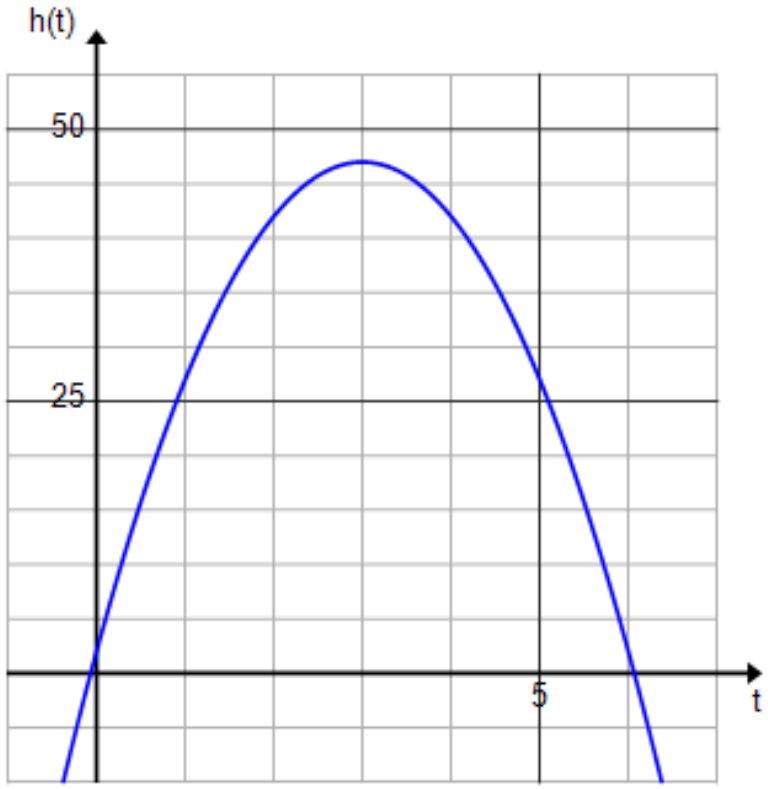
A 1-5 Compare Representations Name

Use with Desmos Sponge Bob Explore.[Linear, Quadratic, and Exponential with SpongeBob • Activity Builder by Desmos Classroom]

1. You are launching a ball from a height of 2 meters at a velocity of 30 m/sec and the Acceleration from gravity is -10m/sec^2 which means the Acceleration Coefficient or scale factor is -5.

Write Equation. h(t)= ____t^2 +____t + _____



t	h(t)
-1	-33
0	2
1	27
2	42
3	47
4	42
5	27
6	2
7	-33
8	-78

The object is increasing from _____seconds to _____ seconds.

The Object is decreasing from _____ seconds to _____ seconds.

The restricted domain or the values of t that make sense in this situation. Write in interval Notation.

The restricted Range or values of h(t) that make sense in this situation. Write in interval Notation.

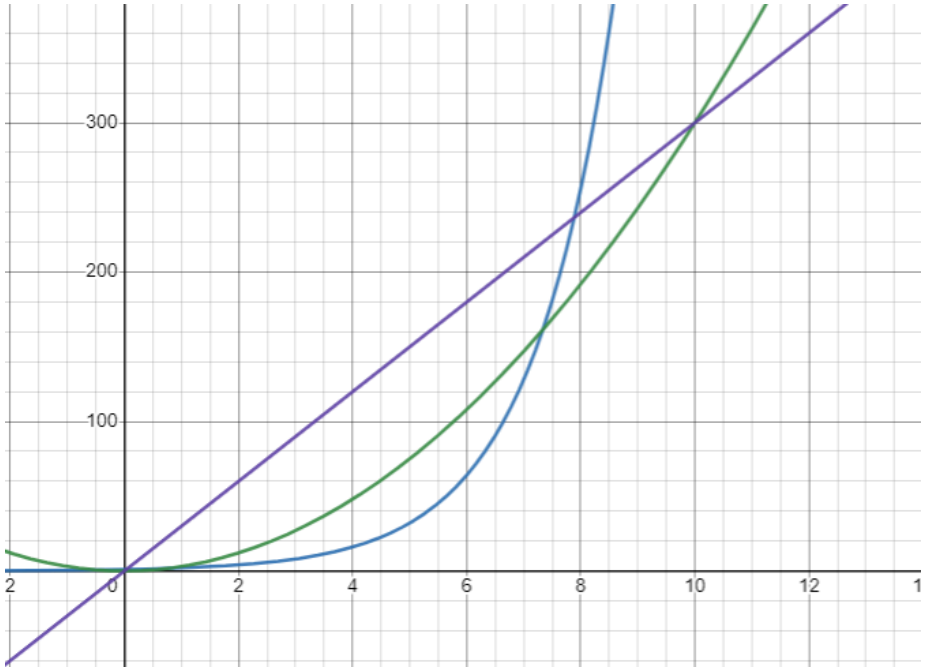
What is the maximum height of the object?

What is the time it gets to the maximum height?

About what time(s) will the object be 35 meters?

About what height will the object be in 4.5 seconds?

You are having a race between 3 animals. The lion follows the equation $L(t) = 2^t$. The antelope follows the curve $A(t) = 3t^2$, and the Fox follows the equation $F(t) = 30t$



t	?
0	0
1	3
2	12
3	27
4	48
5	75
6	108
7	147
8	192
9	243
10	300

t	?
0	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024

t	?
0	0
1	30
2	60
3	90
4	120
5	150
6	180
7	210
8	240
9	270
10	300

Which animal is winning at the first of the race, and for how long? How do you know?	Which animal is winning in the middle? For how long? How do you know?
Which animal wins in the long distances? How do you know?	Of the following functions, which will ALWAYS be largest for very large values of x. Linear Exponential Quadratic

Directions: Read the information below and then answer the questions.

The graph in Figure 1 shows time (minutes) on the x-axis and distance (miles) on the y-axis for cars traveling in the same direction along the freeway. The graph for Car A is a straight line. The graph for Car B is a parabola because it is a quadratic function.

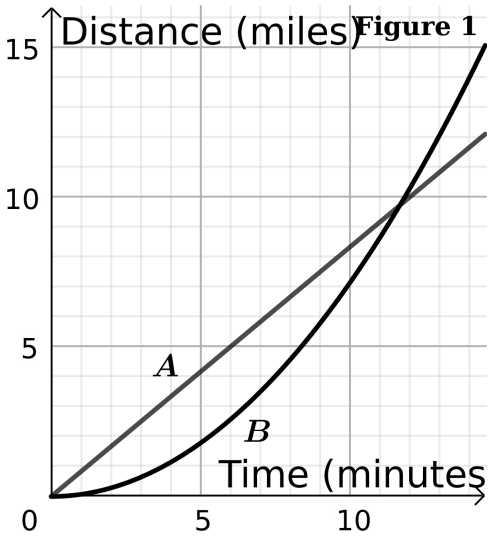


Figure 1

1. Which car has the cruise control on (is maintaining at the same speed)? How do you know?

2. Which car is accelerating? How do you know?

3. Identify the interval in Figure 1 where car A has gone farther than car B.

4. The graph of the speed of a third car, Car C, which has an exponential relationship is now shown in the graph (see Figure 2). All 3 cars have the same destination.

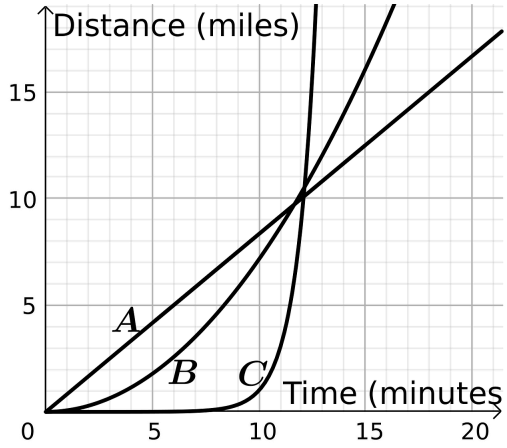


Figure 2

   a. If the destination corresponds with a distance of 12 miles from the origin, which car do you predict will arrive first? Justify your answer.

   b. If the three cars passed the starting point at the same time, and were racing, would there ever be another time that they would be tied? Explain.

   c. Describe the race for these three cars.

5. If the cars are able to proceed beyond a time of 13 minutes, according to the type of function they are being described by, will the lead ever change again? Explain.

6. On a graph that shows distance versus time, what do you look at in order to find speed?