Warm Up

$f(x) = -2x - 9$ $b(x) = x^2 - 3x + 4$

Evaluate:

$f(b(-6))$

b(4) f(-3) b(f(-6))

$b(4) = 4^2 - 3(4) + 4$

$= 8$

$f(x) = -2(-3) - 9$

$= -3$

$b(f(-6))) = (-2x-9)^2 - 3(2x-9) + 4$

$((-2(-6)-9)^2 - 3(2(-6)-9) + 4$

$(3)^2$

Rate of Change

Rate of Change - ratio that compares the amount of change in the dependent variable, to the amount of change in the independent variable.

How to find rate of change:

$$\frac{\text{Change in dependent variable}}{\text{Change in independent variable}} = \frac{\Delta\text{Dependent}}{\Delta\text{Independent}} = \frac{\Delta y}{\Delta x}$$

Δ (delta) is used by mathematicians to mean "change in"

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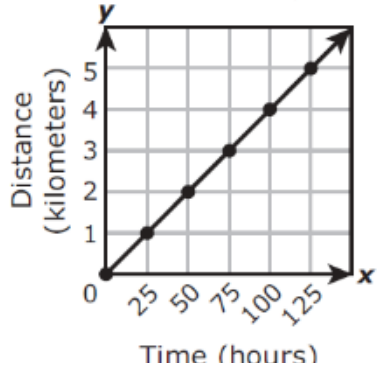
Distance Traveled by a Dolphin



Independent Variable: x

Dependent Variable: y

x	y
25	1
50	2

25 > 1

rate of change $= \frac{\Delta \text{ dep.}}{\Delta \text{ indep.}} = \frac{1}{25} =$ _____

Interpret this rate of change in context of the graph.

Dolphin travels 1 km every 25 hrs

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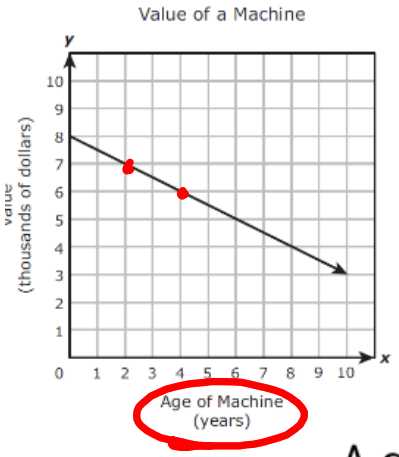


Independent Variable: years

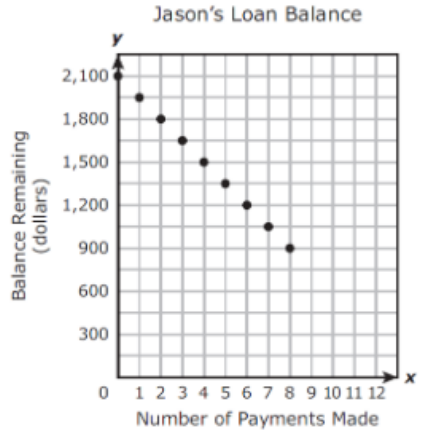
Dependent Variable: $

x	y
2	7
4	6

$$\text{rate of change} = \frac{\Delta \text{ dep.}}{\Delta \text{ indep.}} = \frac{1}{2} = -\frac{1}{2}$$

Interpret this rate of change in context of the graph.

The value of machine goes down as it ages ($1000 every 2 yrs)



Independent Variable:

Dependent Variable:

x	y

$$\text{rate of change} = \frac{\Delta \text{ dep.}}{\Delta \text{ indep.}} = \frac{\qquad}{\qquad} = \qquad$$

Interpret this rate of change in context of the graph.

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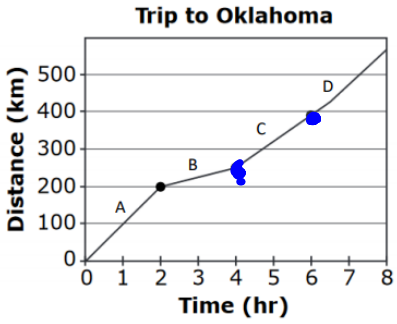

During which segment of the trip does it appear that the car is traveling the fastest? How can you tell? A - because 200 km 2 hrs where others take longer

During which segment of the trip does it appear that the car is traveling the slowest? How can you tell? B - ROC is close horizontal

Calculate the Rate of Change of Each Separate Segment

Independent Variable: Time

Domain: 0, 1, 2, 3, 4, 5, 6, 7, 8

Dependent Variable: Distance

Range: 0, 100, 200, 300, 400, 500

x	y
0	0
2	200
4	250
6	390
8	550

Segment A Rate of Change	Segment B Rate of Change
100 km/hr	25 km/hr
Segment C Rate of Change	**Segment D Rate of Change**
70 km/hr 75 km/hr	80 km/hr

160 / 2

50 / 2

250 / 390

140 / 2

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