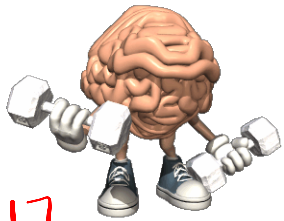
Warm Up



1) $t(x) = 3x^2 + 5$

-17

$\boxed{p(x)} = \dfrac{-3x - 1}{2}$

$t(4) = 3(4)^2 + 5$
$= 3(16) + 5$
$48 + 5$
53

$p(2)$

a) Evaluate
p(-5) x t(4)

$\dfrac{-3(-5)-1}{2}$ $\dfrac{15-1}{2}$ $\dfrac{14}{2} = 7$ 7×53
371

b) Evaluate
p(x) = -17

$-17 \cdot 2 = \dfrac{-3x-1}{2} \cdot 2$

$-34 = -3x - 1$

$\dfrac{-33}{-3} = \dfrac{-3x}{-3}$

$\boxed{x = 11}$

c) Evaluate
t(x) = 113

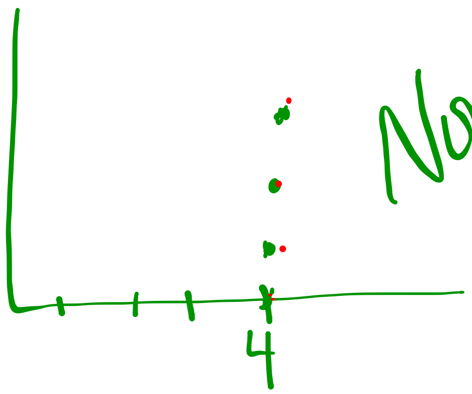
$113 = 3x^2 + 5$

$\dfrac{108}{3} = \dfrac{3x^2}{3}$

$\sqrt{36} = \sqrt{x^2}$

$\boxed{x = 6}$

(4, 3) (4, 2) (4, 1) (4, 0)



Non-function

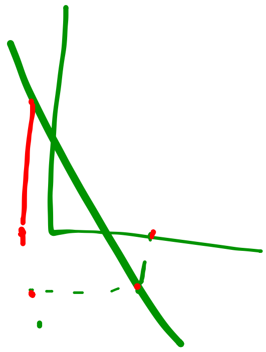
11. $f(x) = -3x + 1$

$x = 1$

$f(1) = -3(1) + 1$

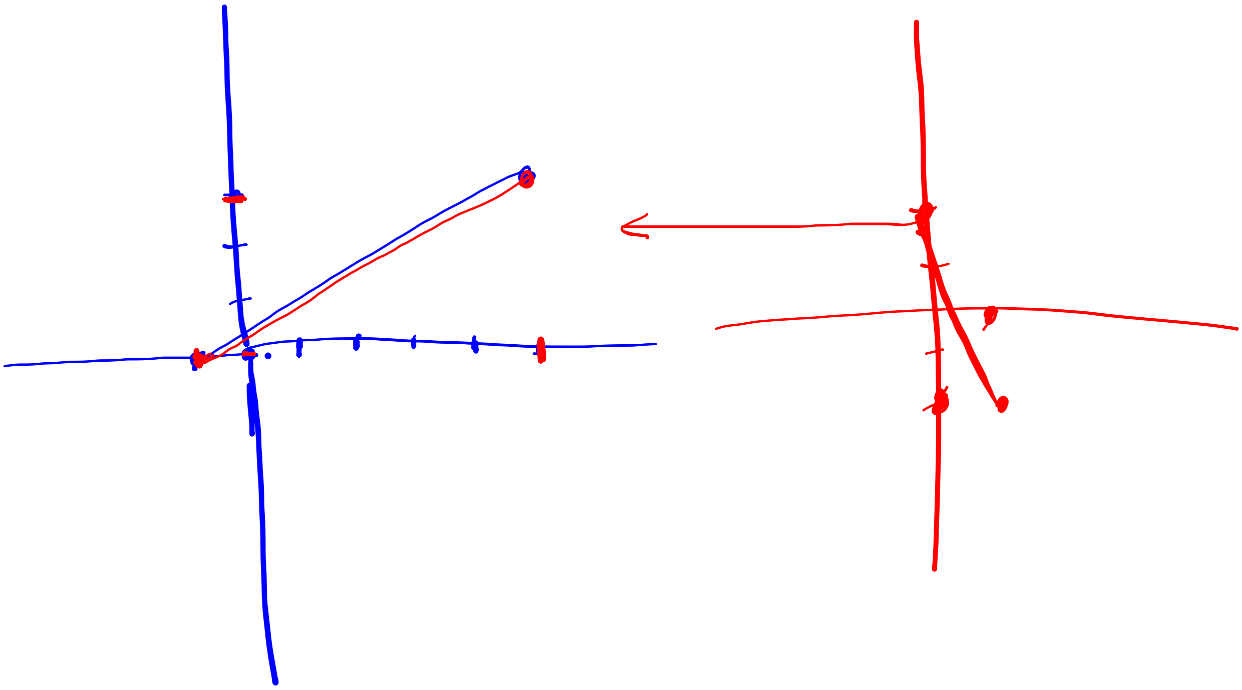
$= -3 + 1$

$= -2$



$4 = -3x + 1$

$\frac{3}{-3} = \frac{-3x}{-3} \quad x = -1$




Linear Relationships

Linear
Relationship

→ Graph (a single line)

→ table of values

→ ordered pairs

constant rate of change

Rate of change

$$\frac{\Delta y}{\Delta x} = \frac{rise}{run}$$

$$= \frac{y_2 - y_1}{x_2 - x_1}$$

The table of values and graph show the cost of a pizza with up to 5 extra toppings.

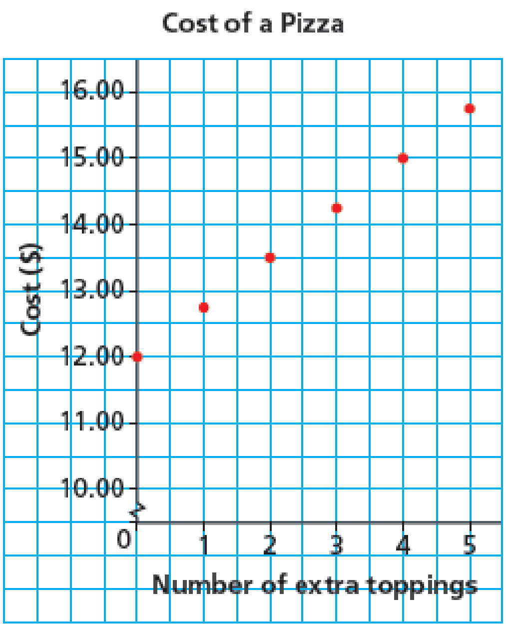
$0.75 / 1 topping

Number of Extra Toppings	Cost ($)
0	12.00
1	12.75
2	13.50
3	14.25
4	15.00
5	15.75

1, 1, 1, 1, 1

0.75, 0.75, 0.75, 0.75, 0.75

Graph



What is the independent variable?

toppings x

What is the dependent variable ?

cost, y

The cost for a car rental is $60, plus $20 for every 100 km driven.
The independent variable is the ? Km and the dependent variable is ? cost

We can identify that this is a linear relation in different ways.

- a table of values

	Distance (km)	Cost ($)	
100	0	60	20
100	100	80	20
100	200	100	20
100	300	120	20
	400	140	

$$\frac{\Delta y}{\Delta x} = \frac{\$20}{100\text{ km}}$$

$$= \frac{\$0.20}{1\text{ km}}$$

?

5.6 Properties of Linear Relations

- a table of values

Independent variable → Distance (km); Cost ($) ← Dependent variable

	Distance (km)	Cost ($)	
	0	60	
+100	100	80	+20
+100	200	100	+20
+100	300	120	+20
+100	400	140	+20

Rate of Change

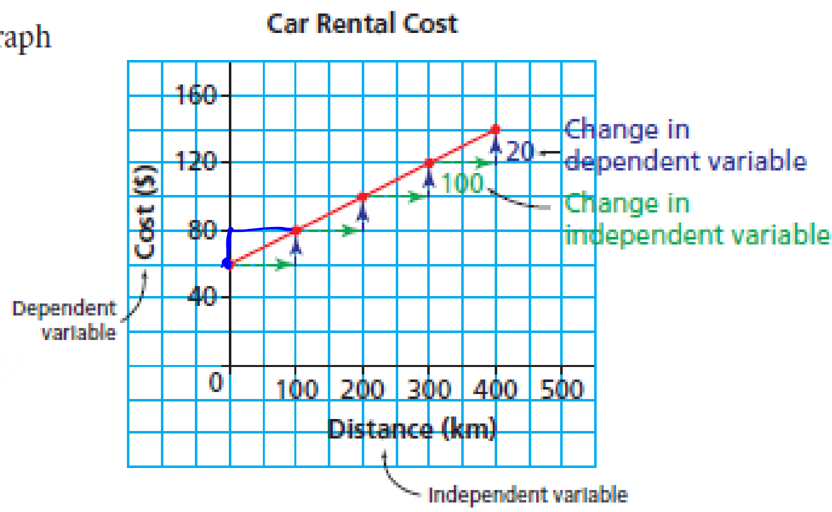
rate of change= $\dfrac{\text{change in dependent variable}}{\text{change in independent variable}} = \dfrac{\$20}{100\text{ km}}$

$= \$0.20/\text{km}$

We can use each representation to calculate the **rate of change**.

$\frac{+20}{100}$

- a graph



The rate of change can be expressed as a fraction:

$$\text{Rate of Change} = \frac{\text{change in dependent}}{\text{change in independent}} = \frac{\text{rise}}{\text{run}}$$

7

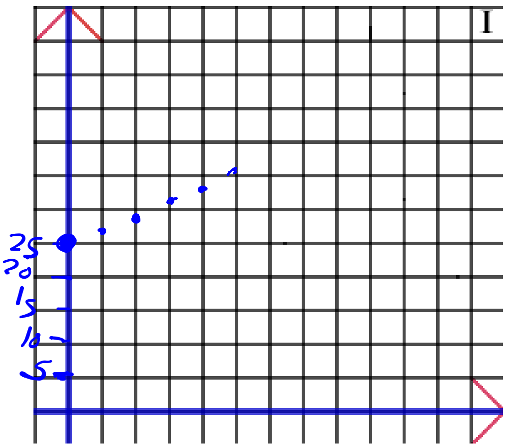
A taxi driver charges a flat fee of $25 and then $2 for every km traveled.

ROC $\frac{2}{1}$

$C = \boxed{2}x + 25$

yint

Graph



Equation

1. How far can you travel for $75?

$75 = 2x + 25$

$-25 \quad -25$

$\frac{50}{2} = \frac{2x}{2}$

$x = 25$

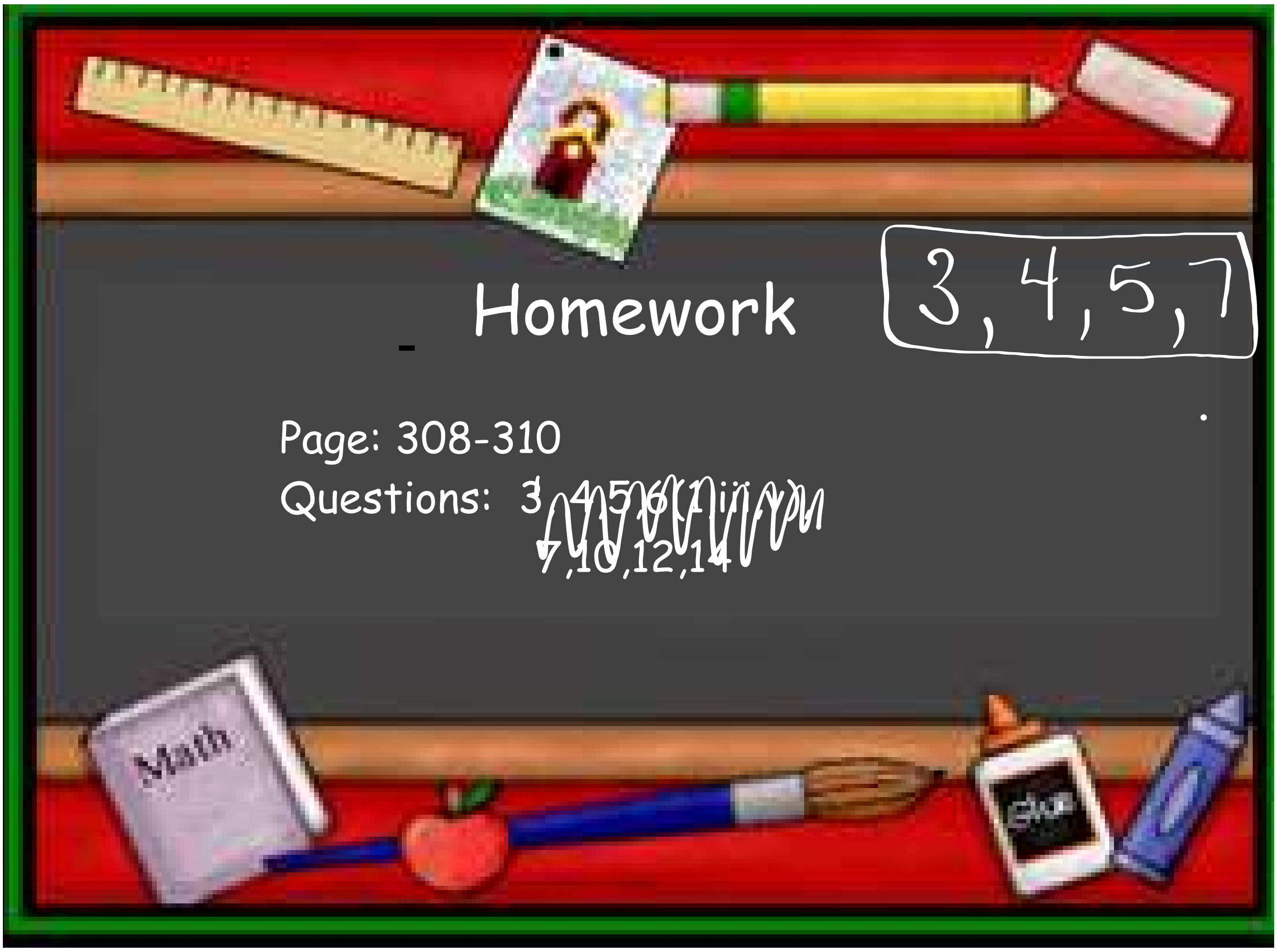
2. How much would it cost to travel 50 km?

$C = 2x + 25$

$C = 2(50) + 25$

$= 100 + 25$

$= 125$


Homework
$\boxed{3,4,5,7}$
Page: 308-310
Questions: 3, 4,5,6
7,10,12,14