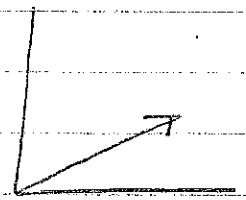
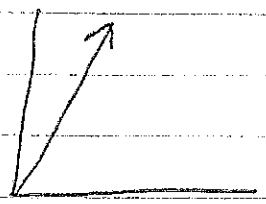
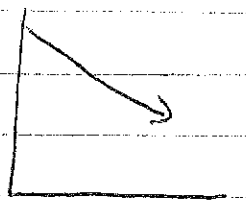
6.1 GRADE 10 - Chapter 6 notes



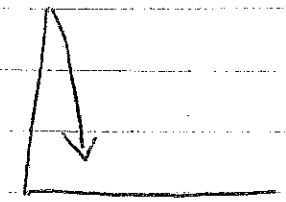
slow increase



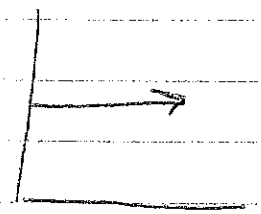
fast increase



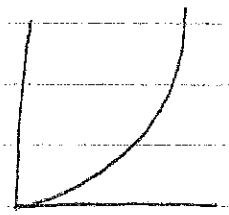
slow decrease



fast decrease

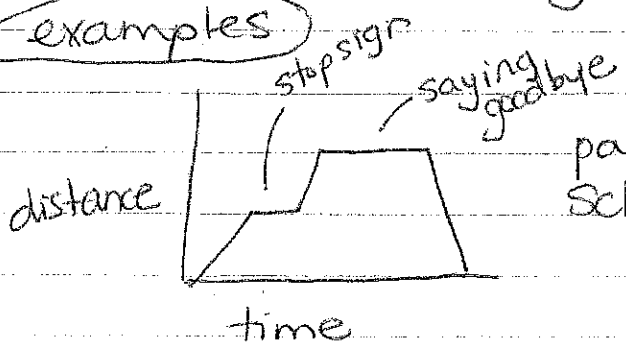


no change

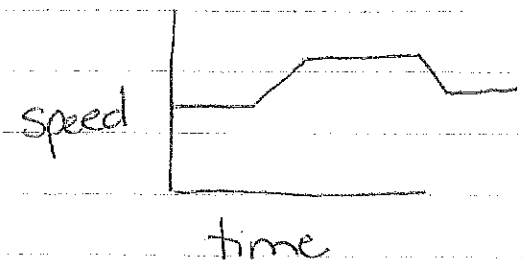


gradually going faster

examples



parent driving child to school then going back home



car on highway passing another car then resuming speed

6.2 Linear Relations

Linear → is a line

discrete data - not connected
continuous data - connected

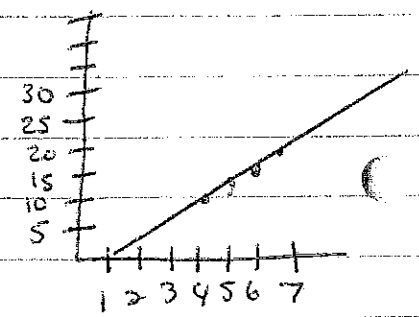
4 ways to represent a relation:

(i) table of values

x	y
4	12
5	14
6	16
7	18

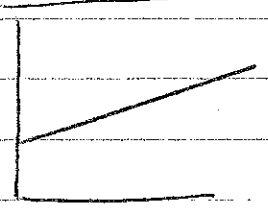
(ii) ordered pairs
(4,12), (5,14)
(6,16) (7,18)

(iii) graph

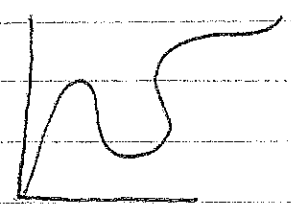


(iv) equation: $2x+4=y$

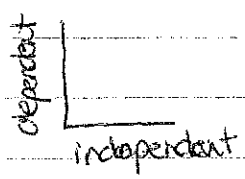
linear:



non linear:



note:



independent vs dependent values

independent: ↳ variable that you use or values are selected

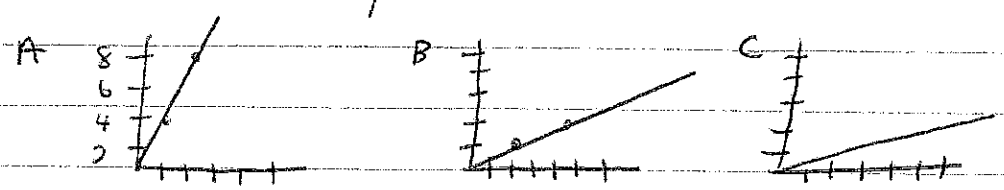
dependent: ↳ answer - "depends" on independent variable selected

ex. # of pens ex. weight

To match equation with a graph, table of values or ordered pairs

* pick a number - and plug into the equation

<u>ex</u> which graph below represents this equation: $L = 4n$



choose 1 $L = 4(1) = 4$ so when $x = 1$ $y = 4$

$L = 4(2) = 8$ so when $x = 2$ $y = 8$

* this matches with graph A

6.3 Domain and Range

I set notation $\{x \mid x \le 10;\ x \in R\}$

$\in R$ ← means all real numbers

" is an element of "

Domain → x values
Range → y values

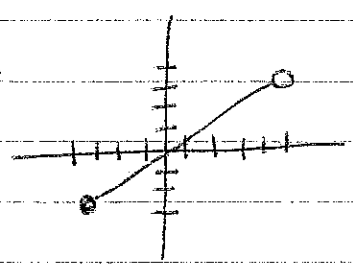
II interval notation:

∞ - means infinity
- used when graph continues ....

[- use when point is included

(- use when it is "up to" but not including this point

ex



interval notation for Domain $[-4, 5)$

set notation for Range
$\{y \mid -3 \le y < 4,\ y \in R\}$

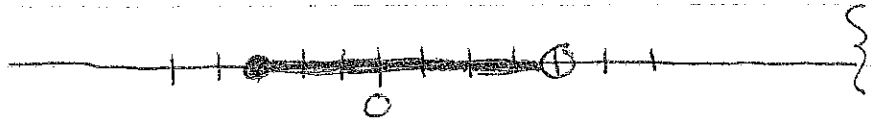
III number line: (of above)

IV A list
write down all numbers

Domain

$\{-4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

Range



$\{-3, -2, -1, 0, 1, 2, 3, 4\}$

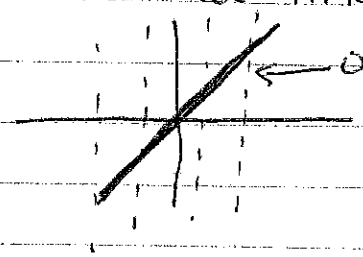
6.4 Functions

* can only be a function if for every x value there is only one y value.

function

x	y
1	2
2	3
3	4
4	5

Vertical line test

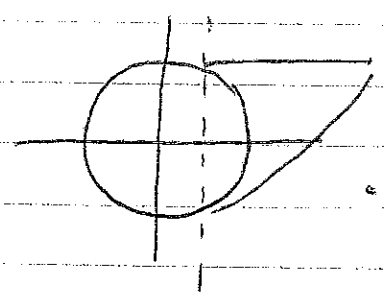


only crosses at one point

not a function:

x	y
1	2
1	3
2	4
2	5

2 diff. answers for same x value



crosses at 2 points

∴ not a function

function notation:

$y = 2x + 3 \implies f(x) = 2x + 3$

f(x) — useful because if you want to find out when $x = 1$ you can write it as

$f(1) = 2x + 3$

$= 2(1) + 3$

$f(1) = 5$

or if you want to find when $y = 9$

$f(x) = 9$

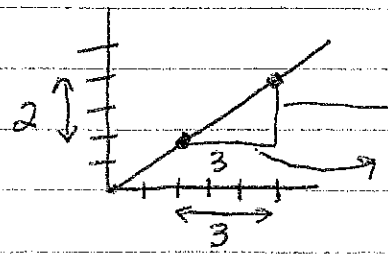
$2x + 3 = 9$

$2x = 6 \implies x = 3$

6.5 Slope: ~ change over time or distance

no slope $\left(\frac{0}{2}\right)$ — positive slope $\left(\frac{3}{2}\right)$ — negative $\left(\frac{-2}{3}\right)$ slope. — undefined slope $\left(\frac{2}{0}\right)$

$$\frac{\text{rise}}{\text{run}} = \frac{\text{change} \updownarrow}{\text{change} \leftrightarrow}$$



connect by drawing a triange

change $\updownarrow$ or rise

change $\leftrightarrow$ or run

$\therefore \frac{\text{rise}}{\text{run}} = \frac{2}{3}$

formula:

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

If given a set of points:

$(-3, 6)$ $(5, 2)$

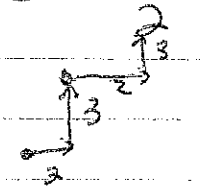
(x_1, y_1) (x_2, y_2)

$$= \frac{2-6}{5--3} = \frac{-4}{8} = -\frac{1}{2}$$

using slope to graph a line:

given point $= (2, 4)$

slope $= \frac{3}{2}$ $\Rightarrow$ this means $3\uparrow$ and $2\rightarrow$



$\rightarrow$ can create line by repeatedly applying slope + placing new point on the line.