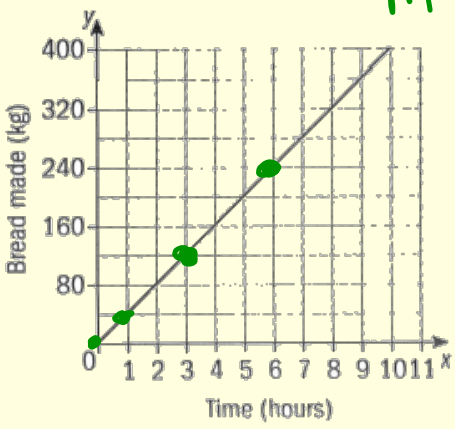
3.1 The gradient of a line

The intercepts of a line

Gradient of a Line

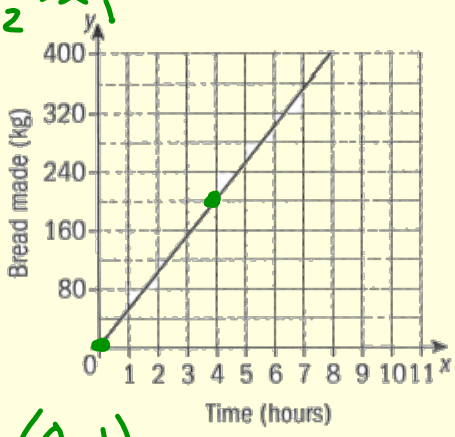
$m = \frac{y_2 - y_1}{x_2 - x_1}$

Machine A



$\frac{40\text{ kg}}{1\text{ hr}}$

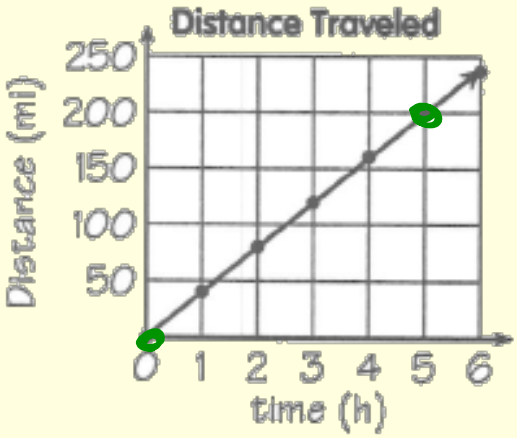
Machine B



(0, 0) (4, 200)

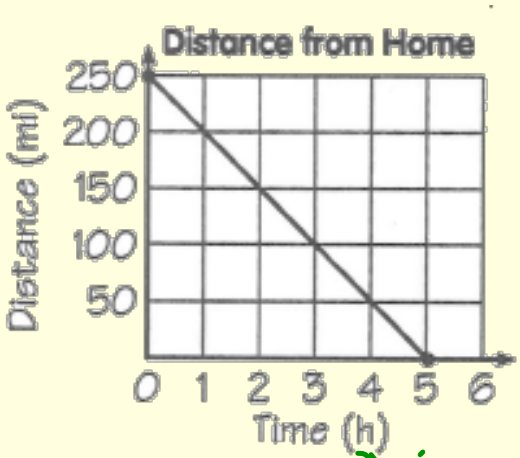
$m = \frac{200 - 0}{4 - 0} = \frac{50\text{ kg}}{1\text{ hr}}$

Gradient of a Line



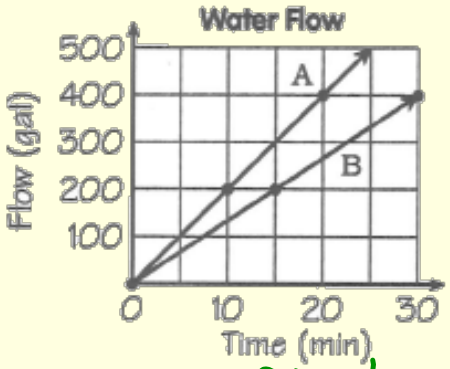
rate of change: $\frac{40\text{ mi}}{\text{hr}}$

$\frac{200-0}{5-0} =$



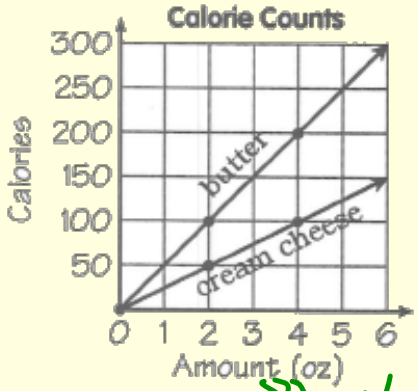
rate of change: $\frac{-30\text{ mi}}{\text{hr}}$

Gradient of a Line



flow rate (A): 20 gal/min

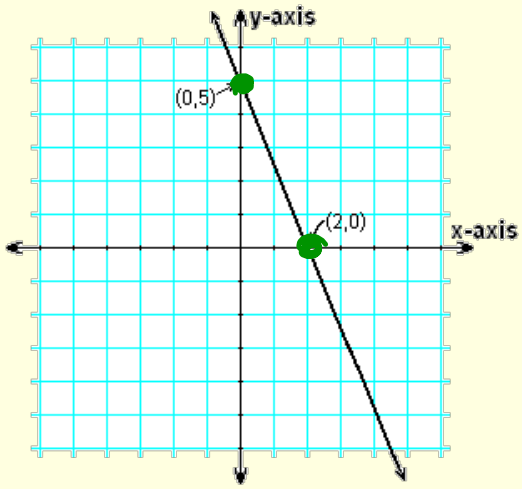
flow rate (B): 13.3 gal/min

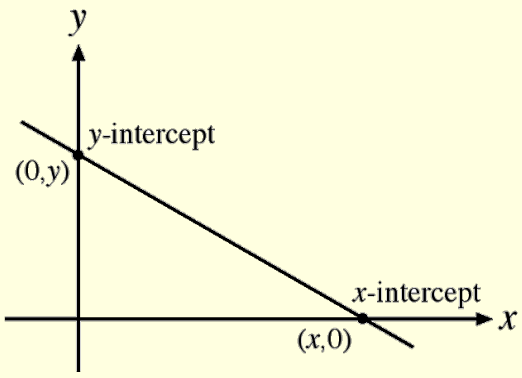


butter: 50 cal/oz

cream cheese: 25 cal/oz.

X- and Y- Intercepts



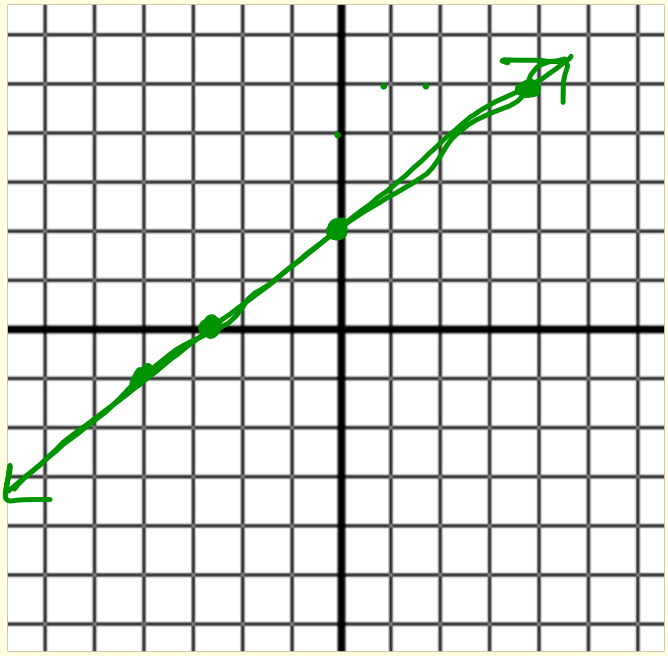


The y-intercept is where $x = 0$.

The x-intercept is where $y = 0$.

$y = mx + b$

$y = \frac{3}{4}x + 2$



slope: $\frac{3}{4}$

y-intercept:

$(0, 2)$

x-intercept:

$0 = \frac{3}{4}x + 2$

$-2 \quad -2$

$\left(\frac{4}{3}\right)\frac{-2}{1} = \frac{3}{4} \times \left(\frac{4}{3}\right)$

$x = -\frac{8}{3} = -2.67$

$Ax + By = C$

$2x + 3y = 6$

slope: $\frac{3y}{3} = \frac{6}{3} - \frac{2x}{3}$

$y = 2 - \frac{2}{3}x$

$y = -\frac{2}{3}x + 2$

y-intercept:

$x = 0$ $(0, 2)$

$2(0) + 3y = 6$

$3y = 6$

$y = 2$

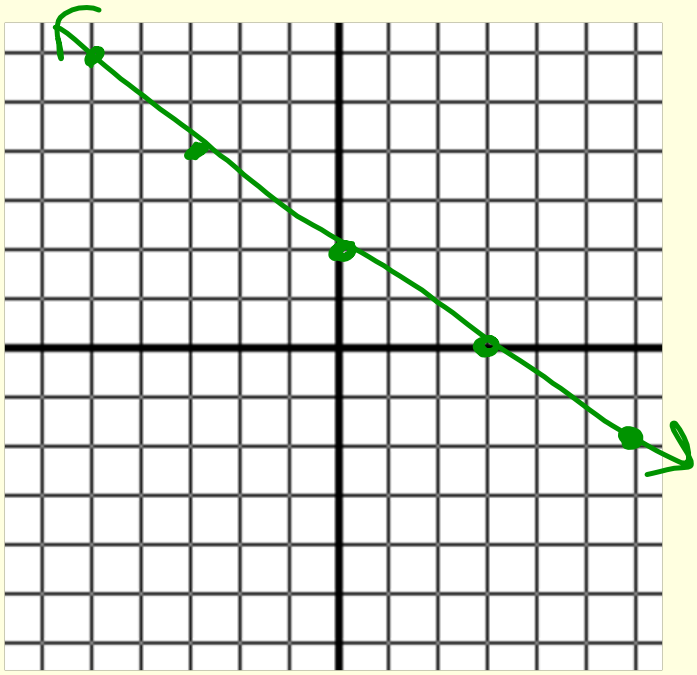
x-intercept:

$y = 0$

$2x + 3(0) = 6$ $(3, 0)$

$2x = 6$

$x = 3$

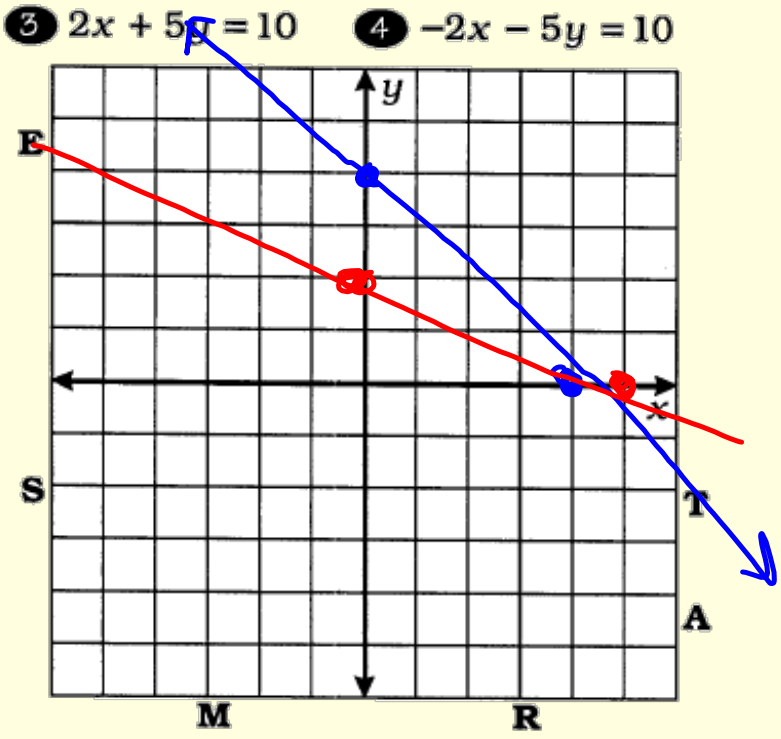


① $x + y = 4$ ② $-x + y = 4$

③ $2x + 5y = 10$ ④ $-2x - 5y = 10$

① | x | y |
|---|---|
| | 4 | 0 |
| | 0 | 4 |

③ | x | y |
|---|---|
| | 5 | 0 |
| | 0 | 2 |



Why Did the Rug Roll Up Around His Girl Friend?

11	6	14	9	2	16	7	12	4	15	5	10	1	13	3	8
H	E	W	A	S	M	A	T	A	B	O	U	T	H	E	R

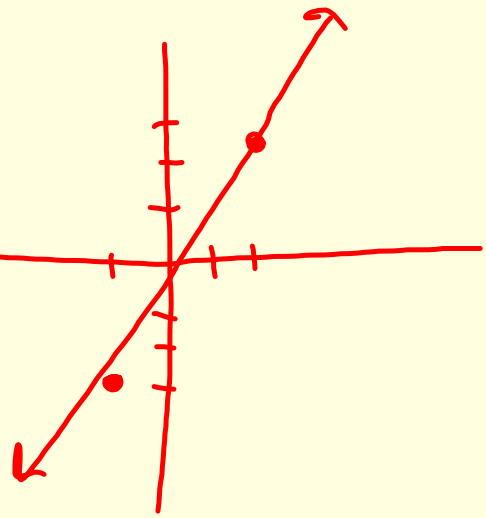
What Did the Inventor of the 10-Ton Truck So Often Say?

$\frac{1}{3}$	-3	2	$-\frac{2}{3}$	0	-2	-1	$-\frac{7}{2}$	$\frac{2}{3}$	$-\frac{3}{5}$	$-\frac{1}{5}$	$\frac{1}{3}$	$\frac{5}{2}$	$\frac{1}{4}$	$\frac{7}{3}$	3
	D	I	E	S	E	L		B	E		G	O	O	D	

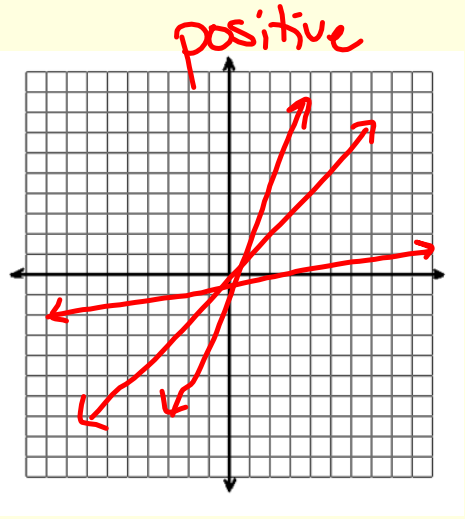
I. $(-1,-3)$
$(2,3)$

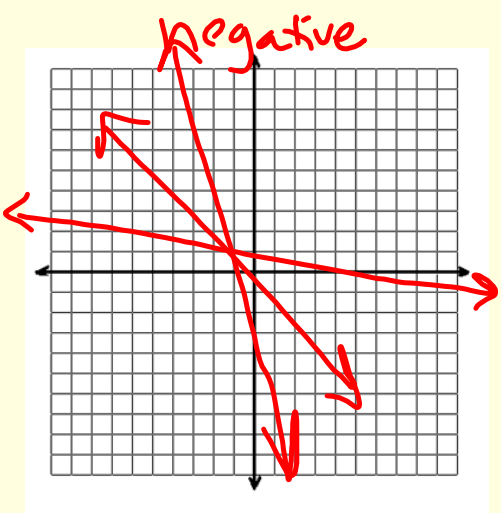
$m = \frac{3-(-3)}{2-(-1)}$

$= \frac{3+3}{2+1} = \frac{6}{3} = 2$



Gradients of Special Lines





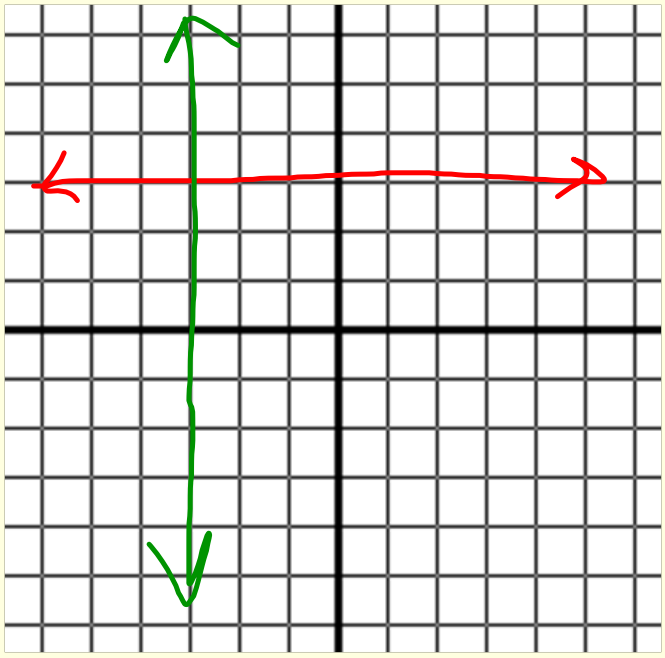
Horizontal Lines:

$m = 0$

Hoy Vux

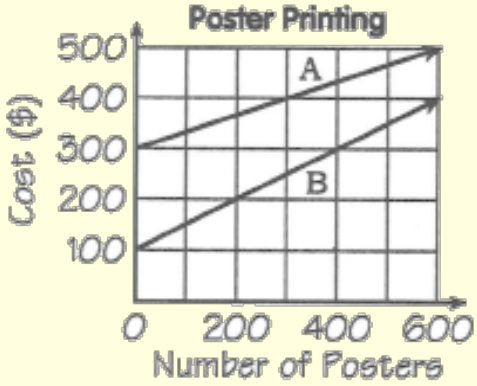
Vertical Lines:

m = Undefined



Gradient of a Line

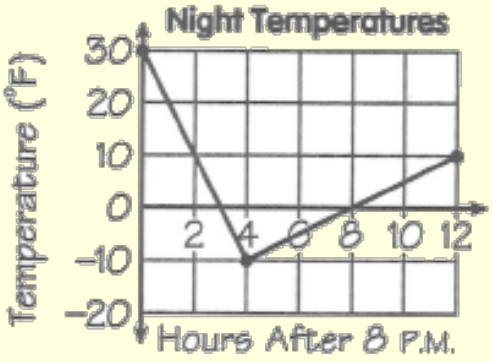
rate for talk time over 400 min: _____



rate for printer A: _____

rate for printer B: _____

Gradient of a Line



rate for first 4 h: _____

rate for next 8 h: _____

Gradient of a Line

TH 25 cal/oz	**GR** −10°F/h	**AB** 4°F/h	**E** $0.33/poster	**ST** 20 gal/min	**UN** $0.45/min	**EA** 0.5 in./wk	**CH** 40 cal/oz
S 40 mi/h	**OF** −62 mi/h	**LO** −2.4 in./h	**BI** 0.8 in./wk	**TU** 2.5°F/h	**G** 35 mi/h	**ET** $0.35/min	**OO** −50 mi/h
J −1.5 in./h	**AM** $0.50/poster	**IX** 50 cal/oz	**ER** 15 gal/min	**PU** 1 in./wk	**LL** −1.33 in./h	**KS** $0.40/poster	**E** 13.3 gal/min

Homework:

pg. 90 3A(2 only)

pg. 91 3B (2, 3 only)

pgs. 92-93 3C (1, 2, 4 only)

pg. 94 3D (4, 5, 7)