

2 Find, in *general form*, the equation of the line through:

a (2, 5) with gradient  $\frac{3}{4}$

SLOPE-INTERCEPT FORM

$$y = mx + c$$

$$5 = \frac{3}{4}(2) + c$$

$$5 = \frac{3}{2} + c$$

$$c = \frac{7}{2}$$

$$c = \frac{7}{2}$$

$$5 = \frac{3}{4}x + \frac{7}{2}$$

REARRANGE INTO  
GENERAL FORM:

$$Ax + By = C$$

A, B, C  $\rightarrow$  INTEGERS  
(NO FRACTIONS)

$$y = \frac{3}{4}x + \frac{7}{2}$$

$$(4)\left(-\frac{3}{4}x + y\right) = \left(\frac{7}{2}\right)(4)$$

$$-3x + 4y = 14$$

$$3x - 4y = -14$$

2 Find, in *general form*, the equation of the line through:

a (2, 5) with gradient  $\frac{3}{4}$

GENERAL FORM, DIRECT METHOD

POINTS (2, 5) AND (x, y)

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GRADIENT EQUATION

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

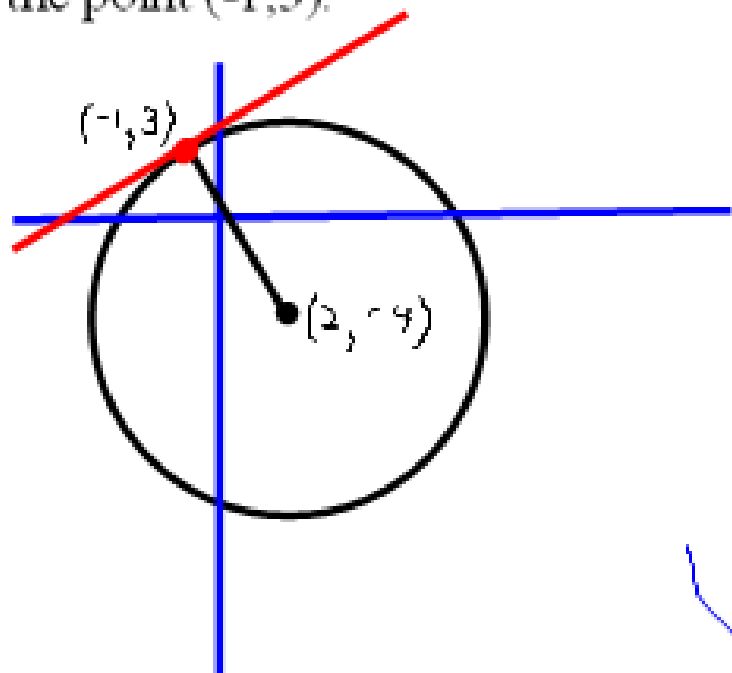
$$\frac{y - 5}{x - 2} = \frac{3}{4}$$

$$4(y - 5) = 3(x - 2)$$

$$4y - 20 = 3x - 6$$

$$\boxed{-3x + 4y = 14}$$

(c) Find the equation of the tangent to the circle with centre  $(2, -4)$  at the point  $(-1, 3)$ .



$$m_{\text{RADIUS}} = \frac{-4 - 3}{2 - (-1)} = -\frac{7}{3}$$

$$m_{\text{TANGENT}} = \frac{3}{7}$$

SLOPE-INT

$$y = mx + c$$

$$3 = \frac{3}{7}(-1) + c$$

$$3 = -\frac{3}{7} + c$$

$$c = 3 + \frac{3}{7}$$

$$c = \frac{21}{7} + \frac{3}{7}$$

THROUGH  
 $(-1, 3)$

$$c = \frac{24}{7}$$

$$y = \frac{3}{7}x + \frac{24}{7}$$

GENERAL FORM

$$\frac{y - 3}{x - (-1)} = \frac{3}{7}$$

$$7(y - 3) = 3(x + 1)$$

$$7y - 21 = 3x + 3$$

$$-3x + 7y = 24$$

2. The given graph shows productivity for various hours of training for five employees.

(a) Which variable is the independent variable?

HOURS OF TRAINING

(b) Which variable is the dependent variable?

PRODUCTIVITY

(c) Who received the most hours of training?

E

(d) Who is the most productive?

E

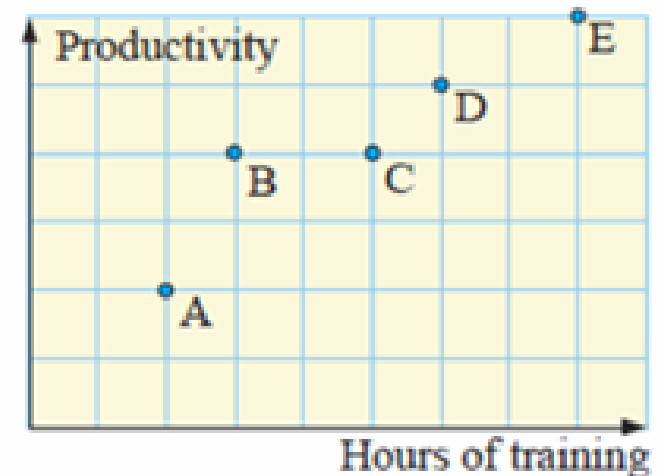
(e) Are there employees with equal productivity?

B & C

(f) Comment on the general trend of this graph.

MORE TRAINING = GREATER PRODUCTIVITY

(POSITIVE SLOPE)



7. Managers of a retail store conduct a customer count to help them decide how to roster sales staff. The results are shown in the line graph:

(a) At what time was there the greatest number of people in the store?

11 am

(b) At what time was there the lowest number of people in the store?

8 pm

(c) Describe what happened in the store between 3 pm and 4 pm.

LOTS OF SHOPPERS ENTERED

(d) Use the graph to estimate the number of people in the store at 9:30 am.

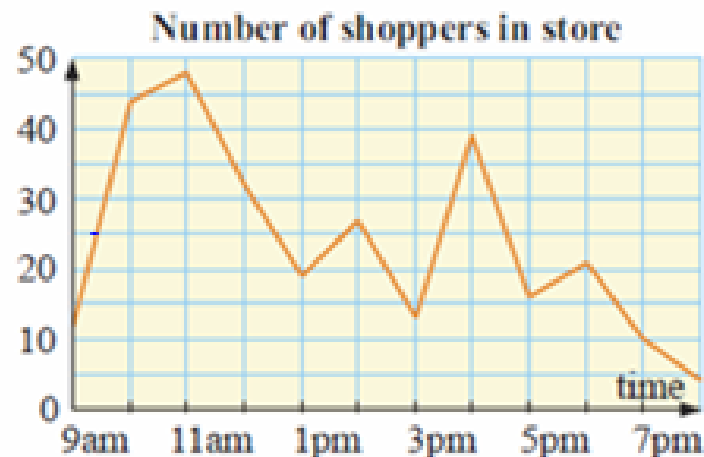
~ 25 PEOPLE

(e) What is wrong with this graph?

10 PEOPLE IN STORE WHEN IT OPENED?

5 " " " " " CLOSED?

(OR IT DOESN'T SHOW OPEN/CLOSE TIMES)



## General Equation of a Linear Relationship:

$$y = mx + b$$

$m$  is the value of the slope

$b$  is the value of the y-intercept

To graph an equation, start by plotting the y-intercept first, then use the slope to find the next points.

Example:

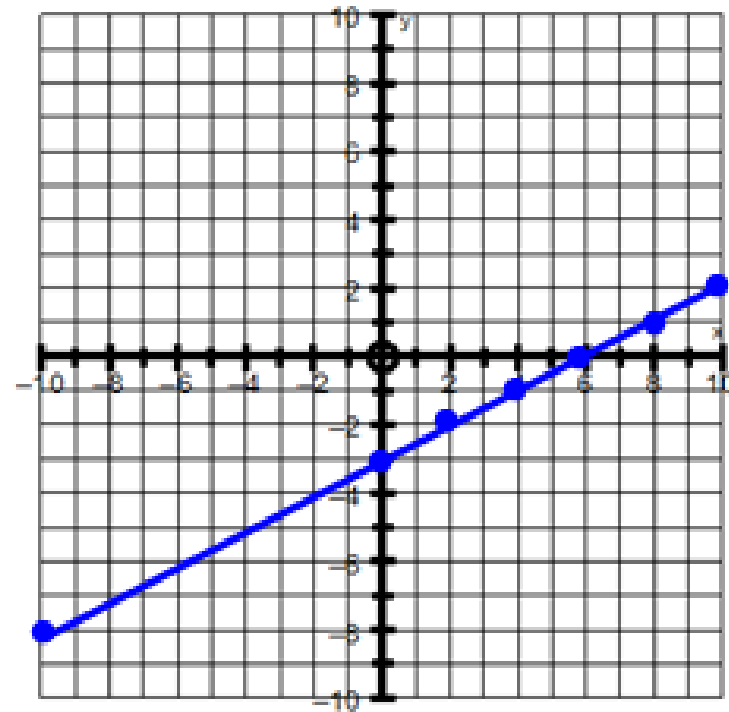
Graph  $y = \frac{1}{2}x - 3$

$b = -3$

START AT  
 $(0, -3)$

$m = \frac{1}{2}$

UP 1  
OVER 2



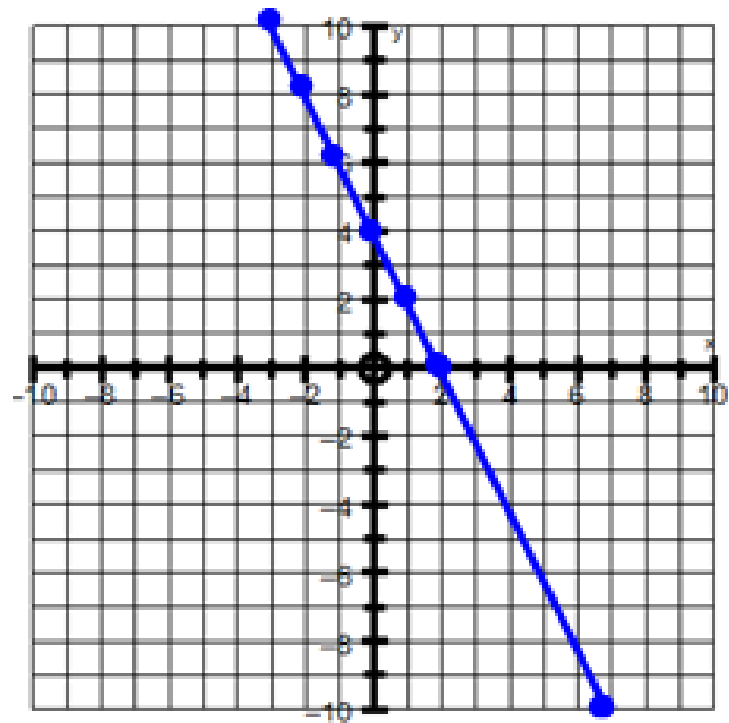
Example:

Graph  $y = -2x + 4$   $\rightarrow$   $(0, -4)$

$\downarrow$   $m = -\frac{2}{1}$

DOWN 2

OVER 1



HOMEWORK

WORKSHEET

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(GENERAL FORM)