

Skill Drill 5

This Drill extends your work with direct proportion to embrace general linear phenomena, including practice interpreting graphs. As in the last Drill the purpose of the first question is to remind you of key points covered in the preceding Review.

1. Review of important points:

(a) Write an equation containing two constants expressing a general linear relationship between y and x .

(b) Sketch a graph of this equation, showing the y -intercept, a "rise" Δy , and the corresponding "run" Δx . Assume the constants are both positive. (A freehand sketch will do.)

(c) How are the constants in the equation related to the intercept, Δy , and Δx ?

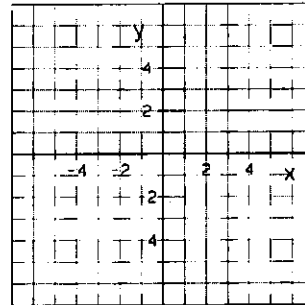
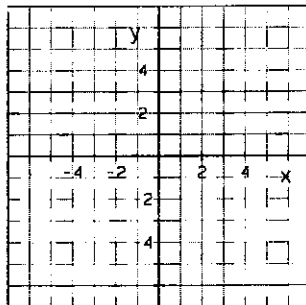
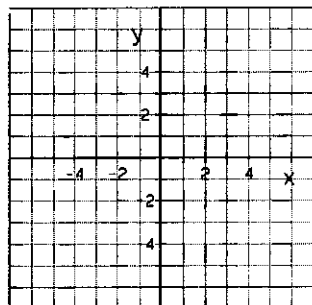
(d) Sketch a graph of a linear equation with both a negative slope and a negative y -intercept.

2. On the graphs provided below draw in lines representing each of the following equations:

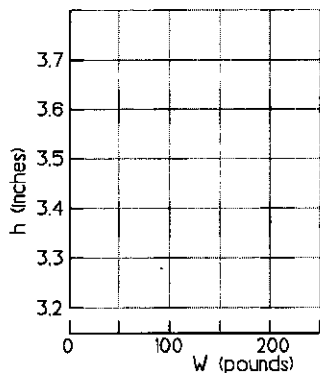
(a) $y = x + 5$

(b) $y = -x + 3$

(c) $y = -2x - 3$



3. The height h above the floor of the platform of a bathroom scale when persons of different weight W step on it is given in this table:



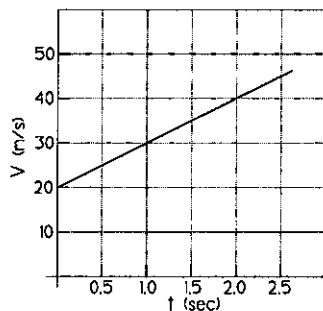
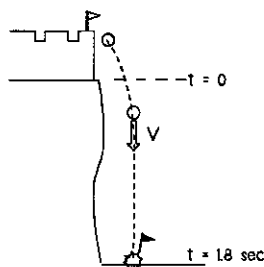
h (inches)	W (pounds)
3.5	100
3.4	150
3.3	200
3.2	250

(a) Plot this data on the graph of h versus W at the left.

(b) Find the slope of the line including correct units and sign.

(c) What is the height of the platform above the floor when nobody is standing on it?

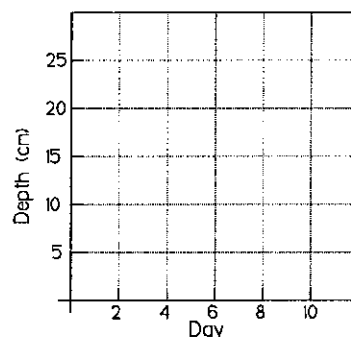
4. The graph below gives the speed v of a boulder dropped from a castle wall onto troops at the base of the cliff on which the castle stands. The time t refers to the number of seconds after the boulder has passed by the base of the castle.



(a) Find the slope g and the intercept v_0 of the line. Use these numbers in an equation which gives v in terms of t . (b) From the equation find the speed of the boulder when it strikes the troops at $t = 1.8$ s.

5. The depth of distilled water in a laboratory storage jug varies from day to day as follows:

Day	Depth (cm)
2	26
4	22
6	18
10	10



(a) Plot these data on the graph at the right, and draw a straight line through the points. (b) Using the slope and the intercept of your graph write a linear equation representing these data. (c) What might you suppose the depth of water was on day zero?

6. Wall thermometers frequently have scales for degrees Celsius and Fahrenheit printed side by side, as illustrated here.

(a) On the graph below draw a straight line representing the relationship between $^{\circ}\text{F}$ and $^{\circ}\text{C}$. (Label the graph and pick out enough points from the drawing to construct a reasonably accurate line.) (b) Determine the slope and intercept. (c) Using these results write down a formula relating $^{\circ}\text{F}$ and $^{\circ}\text{C}$.

