**Straight Line Practice**

Straight Line

Article 28: Right to education
Article 29: Goals for education

# Finding the gradient:

Calculate the gradient of the line joining each pair of points below:

| | | | | | |
|---|---|---|---|---|---|
| **(a)** | (2, 1) and ( 6, 3) | **(b)** | (1, 5) and (3, 1) | **(c)** | (2, 0) and (4, 6) |
| **(d)** | (4, 3) and (8, 11) | **(e)** | (1, 9) and (3, 1) | **(f)** | (7, 3) and (5, 2) |
| **(g)** | (−2, −3) and (2, 3) | **(h)** | (−1, 2) and (5, −1) | **(i)** | (−4, 2) and (4, −4) |
| **(j)** | (−6, −2) and (−5, 3) | **(k)** | (4, −3) and (6, 5) | **(l)** | (−2, 3) and (0, −2) |

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# Extension - Collinearity

Prove that the following sets of points are collinear:

**(a)** A(–6,–1), B(2, 3) and C(4, 4)

**(b)** P(1, –1), Q(–3, 5) and R(7, –10)

**(c)** E(5, –3), F(11, –2) and G(–7, –5)

**(d)** K(5, –4), L(–1, 4) and M(9½ , –10)

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# Straight Line Equation

Straight lines can be expressed in terms of the gradient m and the y-intercept using the equation

$$y = mx + c$$

We can read the gradient and y-intercept straight from the equation.

**For each line, write down the gradient and the coordinates of the point where it crosses the $y$ – axis**(the y-intercept).

**(a)** $y = 3x + 1$ **(b)** $y = \frac{1}{2}x - 5$ **(c)** $y = -2x + 3$

**(d)** $y = -\frac{1}{4}x - 2$ **(e)** $y = 8x - \frac{1}{2}$ **(f)** $y = -x + 4$

# Task 1: 5 Minutes

Forming/Rearranging Straight Line Equation

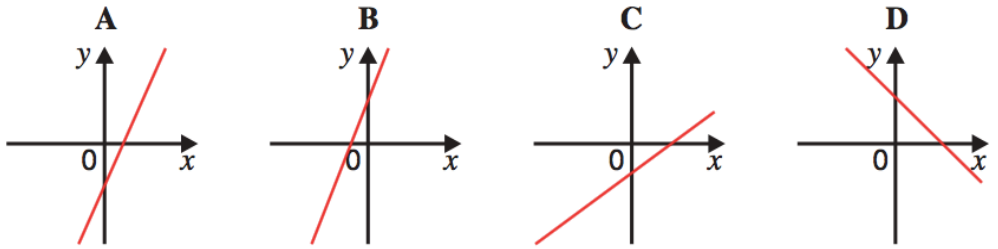
Match the following equations to their graphs.

(1) $y = x - 6$

(2) $y = 6 - x$

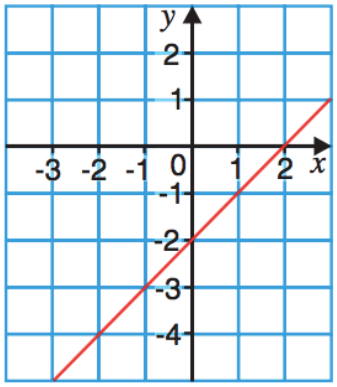
(3) $y = 2x + 1$

(4) $y = 2x - 1$

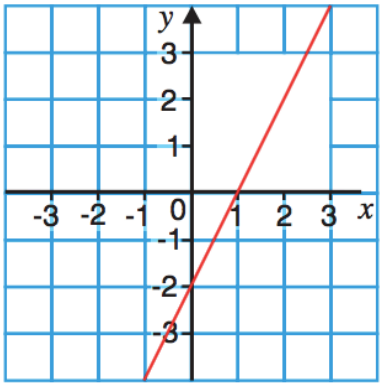



Find the equations of the lines shown on the following graphs.

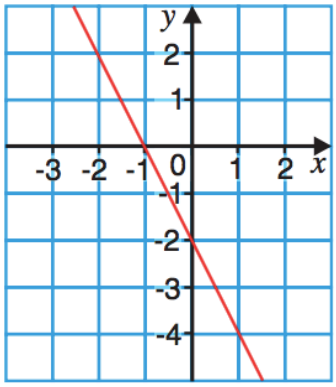
(a)




(b)




(c)




# Task 2:

For each of the lines below determine the gradient and where it crosses the both axes.

(a) $2x + 4y + 6 = 0$ (b) $x + 2y - 1 = 0$

(c) $3y - 3x + 1 = 0$ (d) $2y - 6x + 4 = 0$

(e) $2x + y = 16$ (f) $3x + y + 1 = 0$

(g) $3y + 3 = x$ (h) $2y + 8 = \frac{1}{2}x.$

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**1. Using y - b = m(x - a), find the equation of these straight lines.**

**(a) Gradient 2, passing through (2,7)**

**(b) Gradient -5, passing through (-4,2)**

**(c) Gradient -3, passing through (-4,-8)**

**2. Find the equation of the following straight lines.**

**(a) Gradient $^{1}/_{2}$, passing through (1,-5)**

**(b) Gradient $^{1}/_{3}$, passing through (0,-3)**

**(c) Gradient $^{4}/_{3}$, passing through (-2,9)**

**(d) Gradient $^{-1}/_{2}$, passing through (2,0)**

**(e) Gradient $^{-3}/_{2}$, passing through (-1,-3)**

Straight Line Equation
$y - b = m(x - a)$ #1

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Find the equation of the lines which pass through each pair of points :-

(a) E(2, 7), F(6, 15)

(b) G(1, 5), H(3, 17)

(c) I(1, 5), J(21, 25)

(d) K(4, 0), L(–2, –12)

(e) M(1, 0), Q(–3, 4)

**1.**

Find the equation of the line which passes through the points :-

(a) G(4, 4), K(6, 5)

(b) P(8, 3), T(12, 4)

(c) R(3, –1), S(6, 1)

(d) T(6, 0), U(18, 4)

(e) V(–5, 3), W(5, 5)

**2.**

Straight Line Equation y - b = m(x - a) #2

Find the equation of the line which passes through the points :-

(a) E$(1, 2\frac{1}{2})$, F$(-2, -\frac{1}{2})$

(b) G(2·5, 7), H(–0·5, –2)

(c) J$(1, 2\frac{1}{3})$, K$(-3, -1\frac{2}{3})$

**3.**

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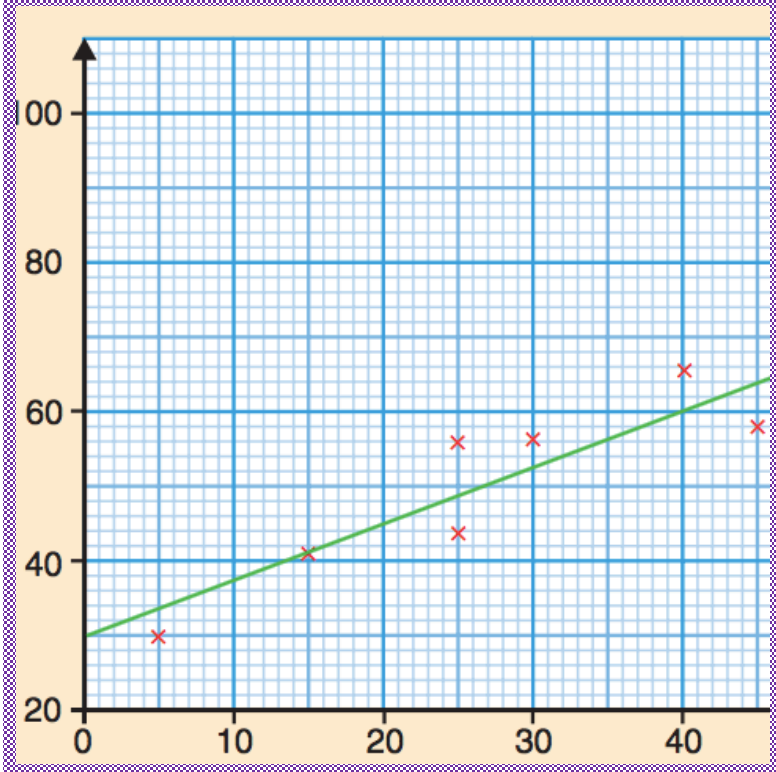


(a) Determine the equation of the line of best fit.

(b) Estimate the paper 2 mark of a pupil scoring 60% on paper 1.

Best Fit Line #1

**Straight Line Practice**

Straight Line

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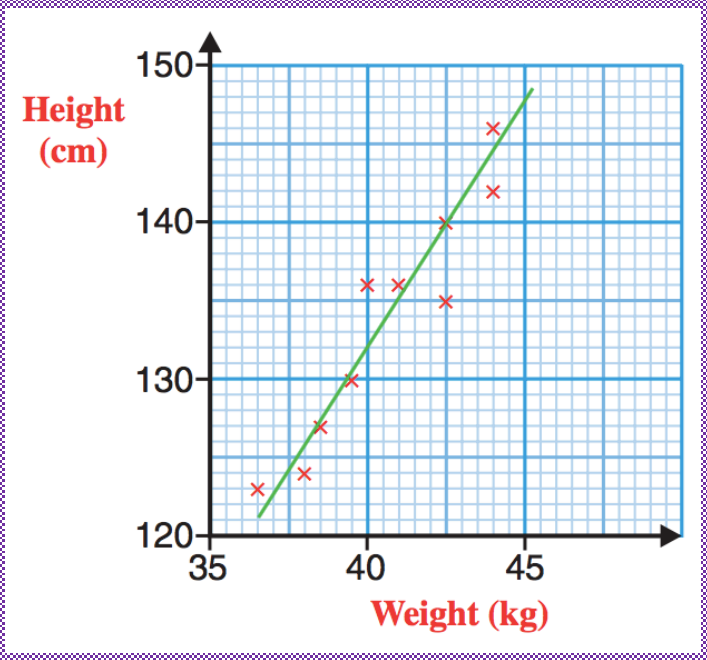


(a) Determine the equation of the line of best fit in terms of H and W.

(b) Estimate the height of a boy weighing 42kg.

Best Fit Line #2

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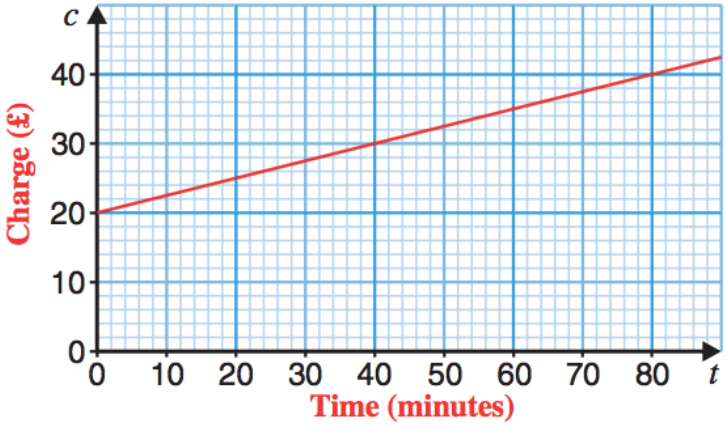


(a) Determine the equation of the line of best fit in terms of C and t.

(b) Estimate the cost of a repair taking 52 minutes.

Best Fit Line #3