Equation of a Straight Line GREEN

1. Write the gradient and the y-intercept of each of the linear equations below:

   a) $y = 3x + 4$ b) $y = \frac{1}{2}x - 2$

   c) $y = 4 - x$ d) $y = \frac{6x+3}{2}$

   e) $2x + 3y - 6 = 0$ f) $8x - 2y + 4 = 0$

2. Find the equation of the line with gradient m that passes through the point given:

   a) $m = 2$ and $(2, 5)$ b) $m = 3$ and $(-2, 1)$

   c) $m = -1$ and $(3, -6)$ d) $m = -4$ and $(-2, -3)$

   e) $m = \frac{1}{2}$ and $(-4, 10)$ f) $m = -\frac{2}{3}$ and $(-6, -1)$

3. Find the equation of the line that passes through these pairs of points:

   a) $(2, 4)$ and $(3, 8)$ b) $(0, 2)$ and $(3, 5)$

   c) $(-2, 0)$ and $(2,8)$ d) $(5, -3)$ and $(7, 5)$

   e) $(-1, -5)$ and $(-3, 3)$ f) $\left(\frac{1}{3}, \frac{2}{5}\right)$ and $\left(\frac{2}{3}, \frac{4}{5}\right)$

4. The line joining $(3, -5)$ to $(6, a)$ has gradient 4. Work out the value of a.

5. Show that the points $A(2, 3)$, $B(4, 4)$ and $C(10, 7)$ can be joined by a straight line.

6. Find the equation of the line which passes through the points $A(7, 2)$ and $B(9, -8)$. Give your answer in the form $ax + by + c = 0$.

7. The vertices of the triangle ABC have coordinates $A(3, 5)$, $B(-2, 0)$ and $C(4, -1)$. Find the equations of the sides of the triangle.

8. The straight line l passes through $(a, 4)$ and $(3a, 3)$. An equation of l is $x + 6y + c = 0$. Find the value of a and the value of c.

9. The line that passes through the coordinates $(-3, -5)$ and $(4, 9)$ meets the y-axis at the point G. Work out the coordinates of the point G.

10. The lines $y = x - 5$ and $y = 3x - 13$ intersect at the point S. The point T has coordinates $(-4, 2)$. Find the equation of the line that passes through the points S and T.

Equation of a Straight Line AMBER

1. Write the gradient and the y-intercept of each of the linear equations below:

   a) $y = 3x + 4$ b) $y = \frac{1}{2}x - 2$

   c) $y = 4 - x$ d) $y = \frac{6x+3}{2}$

   e) $2x + 3y - 6 = 0$ f) $8x - 2y + 4 = 0$

2. Find the equation of the line with gradient m that passes through the point given:

   Use the formula $y - y_1 = m(x - x_1)$ to find the equation of the line

   a) $m = 2$ and $(2, 5)$ b) $m = 3$ and $(-2, 1)$

   c) $m = -1$ and $(3, -6)$ d) $m = -4$ and $(-2, -3)$

   e) $m = \frac{1}{2}$ and $(-4, 10)$ f) $m = -\frac{2}{3}$ and $(-6, -1)$

3. Find the equation of the line that passes through these pairs of points:

   Use the formula $\frac{y_2 - y_1}{x_2 - x_1}$ to calculate the gradient, then $y - y_1 = m(x - x_1)$ to find the equation of the line

   a) $(2, 4)$ and $(3, 8)$ b) $(0, 2)$ and $(3, 5)$

   c) $(-2, 0)$ and $(2,8)$ d) $(5, -3)$ and $(7, 5)$

   e) $(-1, -5)$ and $(-3, 3)$ f) $\left(\frac{1}{3}, \frac{2}{5}\right)$ and $\left(\frac{2}{3}, \frac{4}{5}\right)$

4. The line joining $(3, -5)$ to $(6, a)$ has gradient 4. Work out the value of a.

   Use the formula $\frac{y_2 - y_1}{x_2 - x_1} = 4$

5. Show that the points $A(2, 3)$, $B(4, 4)$ and $C(10, 7)$ can be joined by a straight line.

   Use the formula $\frac{y_2 - y_1}{x_2 - x_1}$ to calculate gradient AB and BC

6. Find the equation of the line which passes through the points $A(7, 2)$ and $B(9, -8)$. Give your answer in the form $ax + by + c = 0$.

   You will have to rearrange your answer

7. The vertices of the triangle ABC have coordinates $A(3, 5)$, $B(-2, 0)$ and $C(4, -1)$. Find the equations of the sides of the triangle.

8. The straight line l passes through $(a, 4)$ and $(3a, 3)$. An equation of l is $x + 6y + c = 0$. Find the value of a and the value of c.

9. The line that passes through the coordinates $(-3, -5)$ and $(4, 9)$ meets the y-axis at the point G. Work out the coordinates of the point G.

10. The lines $y = x - 5$ and $y = 3x - 13$ intersect at the point S. The point T has coordinates $(-4, 2)$. Find the equation of the line that passes through the points S and T.

Equation of a Straight Line RED

1. Write the gradient and the y-intercept of each of the linear equations below:

a) $y = 3x + 4$

b) $y = \frac{1}{2}x - 2$

c) $y = 4 - x$

d) $y = \frac{6x+3}{2}$

e) $2x + 3y - 6 = 0$

f) $8x - 2y + 4 = 0$

2. Find the equation of the line with gradient m that passes through the point given:

Use the formula $y - y_1 = m(x - x_1)$ to find the equation of the line

a) $m = 2$ and $(2, 5)$

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

$y =$

b) $m = 3$ and $(-2, 1)$

c) $m = -1$ and $(3, -6)$

d) $m = -4$ and $(-2, -3)$

e) $m = \frac{1}{2}$ and $(-4, 10)$

f) $m = -\frac{2}{3}$ and $(-6, -1)$

3. Find the equation of the line that passes through these pairs of points:

Use the formula $\frac{y_2 - y_1}{x_2 - x_1}$ to calculate the gradient, then $y - y_1 = m(x - x_1)$ to find the equation of the line

a) $(2, 4)$ and $(3, 8)$

$m = \frac{8 - 4}{3 - 2} =$

$y - 4 = ___(x - 2)$

$y =$

b) $(0, 2)$ and $(3, 5)$

c) $(-2, 0)$ and $(2,8)$

d) $(5, -3)$ and $(7, 5)$

e) $(-1, -5)$ and $(-3, 3)$

f) $\left(\frac{1}{3}, \frac{2}{5}\right)$ and $\left(\frac{2}{3}, \frac{4}{5}\right)$

4. The line joining $(3, -5)$ to $(6, a)$ has gradient 4. Work out the value of a.

Use the formula $\frac{y_2 - y_1}{x_2 - x_1} = 4$

$$4 = \frac{a - -5}{6 - 3}$$

Rearrange and solve to find a

5. Show that the points $A(2, 3)$, $B(4, 4)$ and $C(10, 7)$ can be joined by a straight line.

Use the formula $\frac{y_2 - y_1}{x_2 - x_1}$ to calculate gradient AB and BC

6. Find the equation of the line which passes through the points $A(7, 2)$ and $B(9, -8)$. Give your answer in the form $ax + by + c = 0$.

You will have to rearrange your answer

7. The vertices of the triangle ABC have coordinates $A(3, 5)$, $B(-2, 0)$ and $C(4, -1)$. Find the equations of the sides of the triangle.

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10. The lines $y = x - 5$ and $y = 3x - 13$ intersect at the point S. The point T has coordinates $(-4, 2)$. Find the equation of the line that passes through the points S and T.