Starter

1) Change the subject to T: $4 - 3m = 2T$

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

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

2) If k = 2 and j = -3, evaluate $2k^2 - 3j$

$= 2(4) - 3(-3)$

$= 8 - (-9) = 17$

3) Solve the equation for x: $3x - 9 = 1 - 2x$

$+1 \quad +1$

$3x - 10 = -2x$

$-3x \quad +3x$

$-10 = -5x$

$\div -5 \quad \div -5$

$-2 = -x$

$x = 2$

Today's Learning:

To know the general equation of a straight line and identify the equation of a straight line from its graph.

Plot these graphs using a table of values:

$y = 2(-2) + 1 = -4 + 1 = -3$

1) $y = 2x + 1$

x	-2	-1	0	1	2
y	-3				

2) $y = 3x - 4$

x	5	0	1		
y	11	-4	-1		

3) $y = -2x + 2$

Equation of a Straight Line

15/5/17

The general equation of any straight line is **$y = mx + c$**

where ~~m is the gradient~~ and ~~c is the y-intercept~~.

e.g. 1) State the gradient and y-intercept of the line with equation $y = 2x - 3$

gradient = 2

y-int = -3

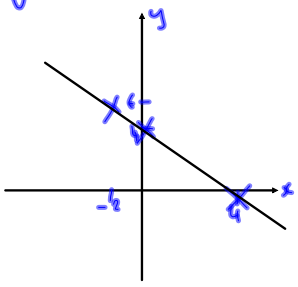
2) Sketch the graph $y = -x + 4$

$x = -2$

$y = -(-2) + 4 = 6$

$x = 4$

$y = -4 + 4 = 0$



Starter

1) Calculate $\frac{2}{y} - \frac{3}{z}$

$= \frac{2z}{y^2} - \frac{3y}{y^2} = \frac{2z-3y}{y^2}$

2) Write in completed square form: $2g^2 - 12g + 8$

$2(g^2 - 6g + 4)$

$2((g-3)^2 - 5)$

$= 2(g-3)^2 - 10$

3) Calculate $5m^3 \times 2m^{-1}$

$10m^2$

4) Fully factorise $3f^3 + 3f^2 - 6f$

$= 3f(f^2 + f - 2)$

$= 3f(f+2)(f-1)$

$(g-3)(g-3)$

$= g^2 - 3g - 3g + 9$

Today's Learning:

To rearrange the equation of a straight line to find the gradient and y-intercept.

Challenge: $y = mx + c$

State the gradient and y-intercept of the line with equation

$2y + 3 = 4x$

$2y = 4x - 3$

$y = 2x - 1.5$

Starter - NO Calculators

1) If the numbers 1 to 20 are on cards, and a card is picked out at random, what is the probability it is a prime number?

2) Estimate the answer to -1.9×385

3) Find the product of 41 and 18 then subtract 357.

4) What is £58 with 10% off?

Rearranging the Equation of a Straight Line

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e.g. 1) $2y = 6x - 1$

$y = 3x - 0.5$

grad = 3 y-int = -0.5

2) $y - 4x + 5 = 0$

$-4x + 5 = -y$

$-y = -4x + 5$

$y = 4x - 5$

grad = 4

y-int = -5

3) $0 = 5y + 4x - 1$

$1 = 5y + 4x$

$1 - 4x = 5y$

$5y = 1 - 4x$

$y = \frac{1}{5} - \frac{4}{5}x$

$y = -\frac{4}{5}x + \frac{1}{5}$

grad = $-\frac{4}{5}$

y-int = $\frac{1}{5}$

State the gradient and y-intercept of the following straight lines:

1) $y = x + 3$ $m = 1$ $c = 3$

2) $y + x = 6$ $m = -1$ $c = 6$

3) $2y = x - 4$ $m = \frac{1}{2}$ $c = -2$

4) $3y = x + 12$ $m = \frac{1}{3}$ $c = 4$

5) $3x - 2y = 12$ $m = \frac{2}{2}$ $c = -6$

6) $y = -4x + 0$ $m = -4$ $c = 0$

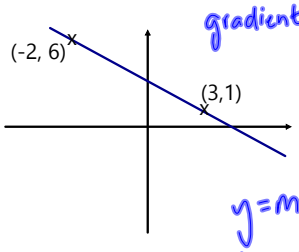
7) $5y = 3x - 10$ $m = \frac{3}{5}$ $c = -2$

8) $3x + 7y - 21 = 0$ $m = \frac{-3}{7}$ $c = 3$

9) $4x - 5y = 20$ $m = \frac{4}{5}$ $c = -4$

Challenge: $y = mx + c$

Find the equation of the straight line that passes through the points (-2, 6) and (3,1)



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

$= \frac{1-6}{3-(-2)}$

$= \frac{-5}{5} = -1$

$y = mx + c$

$1 = -1(3) + c$

$1 = -3 + c$

$+3 \quad +3$

$4 = c$

$y = -1x + 4$

Starter

1) Factorise fully: $3T^2 - 5T - 2$ $(3T + 1)(T - 2)$

$-6T + T$

2) Change the subject of the formula to b: $T - 1 = \frac{2b}{5}$

$\frac{2b}{5} = T - 1$

$\times 5 \quad \times 5$

$2b = 5T - 5$

$b = 2.5T - 2.5$

$\frac{5T - 5}{2}$ 15.70796

3) Find the arc length of a quarter-circle with radius 10 cm.

Arc = $\frac{90}{360} \times \pi \times 20$

$= 15.7\text{cm}$

4) Simplify the surd $\sqrt{72}$

$= \sqrt{36 \times 2}$

$= 6\sqrt{2}$

Today's Learning:

To find the equation of a straight line using two points.

Finding the Equation using Two Points

19/5/17

Find the gradient, then substitute into y = mx + c.

e.g. 1) A(12, 10) and B(6, -2)

x_1, y_1 x_2, y_2

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

$= \frac{-2-10}{6-12}$

$= \frac{-12}{-6} = 2$

$y = mx + c$

$10 = 2 \times 12 + c$

$10 = 24 + c$

$-24 \quad -24$

$-14 = c$

$y = 2x - 14$

2) G(-3, 11) and H(3, -1)

$m = \frac{11-(-1)}{-3-3}$

$= \frac{12}{-6}$

$= -2$

$y = mx + c$

$11 = -2 \times -3 + c$

$11 = 6 + c$

$-6 \quad -6$

$5 = c$

$y = -2x + 5$

Starter

1) Factorise: $m^2 - 4m + 4$ $(m-2)(m-2)$

2) Simplify: $3a^2b \times 10ab^{-1}$ $= 30a^3$

3) Without a calculator, evaluate 3.14 x 5 x 6

	3	0·1	0·04
5	15	0·5	0·2

15·7

	10	5	0·7
6	60	30	4·2

94·2

4) Multiply out the brackets: (2 - e)(e + 4)

$2e + 8 - e^2 - 4e$

$= -2e + 8 - e^2$

Today's Learning:

To revise the equation of a straight line.

Rearrange the following then state the gradient and y-intercept.

1) $2y - 3x = 4$

2) $3 = y + x$

3) $-y = 2 + 3x$

4) $2(x + 1) = y$

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

6) $3y = 7 - (2 - x)$

$y = mx + c$

Change the subject to y

Find the equation of the straight line joining:

1) (2, 3) and (5, 6) $y = x + 1$

2) (2, 2) and (8, 8) $y = x$

3) (-2, 4) and (4, 5) $y = \frac{1}{6}x + 4\frac{1}{3}$

4) (3, 0) and (6, -2) $y = \frac{-2}{3}x + 3$