Starter

1) Solve for T: $5T < 8T - 3$

$5T + 3 < 8T$

$3 < 3T$

$1 < T$

2) Simplify: $\frac{3m^2 - 6m}{m^2 - 8m + 12}$

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

$= \frac{3m}{m-6}$

$x^2 \times x^3 = x^5$

3) Simplify: $\frac{c}{\sqrt[3]{c^2}} = \frac{c^1}{c^{2/3}} = c^{1/3}$

$\sqrt[3]{c}$

4) Solve for m: $3(m - 2) = 2(3 - m) + 9$

$3m - 6 = 6 - 2m + 9$

$5m - 6 = 15$

$5m = 21$

$m = 4\frac{1}{5}$

Today's Learning:

To solve simultaneous equations using graphs.

$2x + y = 7$

$x - y = -1$

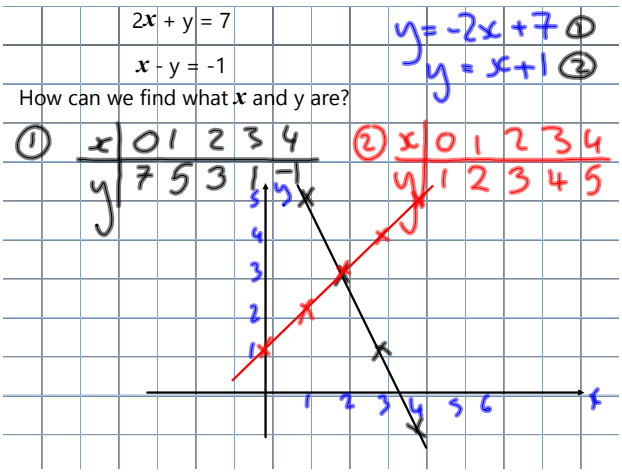
How can we find what x and y are?

$y = -2x + 7$ ①

$y = x + 1$ ②

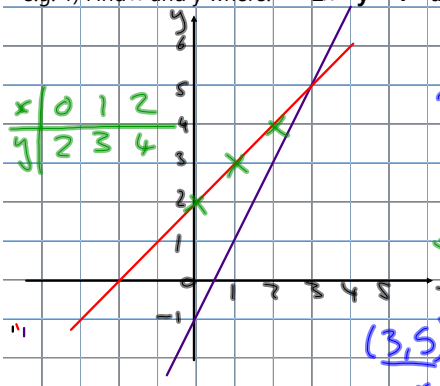
①	x	0	1	2	3	4
y	7	5	3	1	-1

②	x	0	1	2	3	4
y	1	2	3	4	5



Solving Simultaneous Equations Graphically 5/10/16

e.g. 1) Find x and y where: $2x - y = 1$ and $-x + y = 2$



$y = x + 2$

$2x = 1 + y$

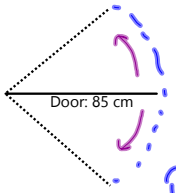
$y = 2x - 1$

x	0	1	2
y	-1	1	3

$(3, 5)$

$x = 3, y = 5$

Starter



The door swings through an angle of 85°. Calculate the length of the dotted perimeter, so it can be marked out in tape.

Perimeter

Arc length $= \frac{85}{360} \times \pi \times d$

$= \frac{85}{360} \times \pi \times 170$

$= 126.1\text{cm}$

Perimeter $= 85 + 85 + 126.1\text{cm}$

$= 296\text{cm}$

Today's Learning:

Soving simultaneous equations using substitution.

In McDonalds, Georgia bought 2 happy meals, and paid 8€. Harry got a happy meal and a McFlurry and paid 6€.

How much does each item cost?

$2 \times h = 8 \rightarrow h = 4$

$h + m = 6$

$4 + m = 6$

$m = 2$

Mike wanted to know the price of tickets and popcorn at the cinema.

All he knows is that James bought 2 tickets and 1 popcorn and that cost £28, and Sarah bought 1 ticket and 3 popcorns and that cost £24.

How could he figure out the price of popcorn and of tickets?

$2T + P = 28$ ① $T + 3P = 24$ ②

$T = 24 - 3P$ $\times 2$ $\times 2$

$2T + 6P = 48$ ③

$2(24 - 3P) + P = 28$

$48 - 6P + P = 28$

$20 - 6P + P = 0$

$20 = 5P$

$P = 4$

$5P = 20$ $P = 4$ $T = 12$

$2T + 4 = 28$

$2T = 24$

$T = 12$

5/10/16 Simultaneous Equations - Substitution

e.g. Find x and y if $3x + 2y = 18$ and $y - x = -1$

$y = x - 1$

$3x + 2(x - 1) = 18$

$3x + 2x - 2 = 18$

$3x + 2x = 20$

$5x = 20$

$x = 4$

$3x + 2y = 18$

$12 + 2y = 18$

$2y = 6$

$y = 3$

Solving by elimination:

$2y + x = 5$

$4y - x = 7$

$6y = 12$

$y = 2$

$x = 1$

Starter

1) Fully factorise: $2m^3 + 14m^2 + 24m$

$= 2m(m^2 + 7m + 12)$

$= 2m(m + 3)(m + 4)$

2) Solve for g: $2g + 9 > -g$

$-2g \quad -2g$

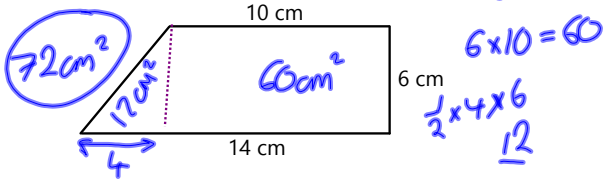
$g > -3g$

$\div 3 \quad \div 3$

$3 > -g \rightarrow -3 < g$

$g > -3$

3) Find the area of the shape:



$6 \times 10 = 60$

$\frac{1}{2} \times 4 \times 6$

12

Today's Learning:

Solving Simultaneous Equations by elimination.

T + B = 6

T - B = 4

$2T = 10$ $5 - B = 4$

$T = 5$ $B = 1$

Solve the following pairs of simultaneous equations:

(a) $x + y = 4$, $x - y = 2$

$2x = 6$, $x = 3$, $y = 1$

(b) $x + y = 9$, $x - y = 5$

$2x = 14$, $x = 7$, $y = 2$

(c) $x + y = 7$, $x - y = 3$

$2x = 10$, $x = 5$, $y = 2$

$5 + y = 7$, $y = 2$

(d) $3x + y = 9$ ① , $x + y = 5$ ②

②×(-1): $-x - y = -5$

① $3x + y = 9$

$2x = 4$, $x = 2$

$x + y = 5$, $2 + y = 5$, $y = 3$

(e) $4x + y = 11$ ① , $2x + y = 5$ ②

②×-1: $-2x - y = -5$

① $4x + y = 11$

$2x = 6$, $x = 3$

$4x + y = 11$

$4(3) + y = 11$

$12 + y = 11$, -12, -12

$y = -1$

(f) ① $7x + 2y = 36$, ② $2x + 2y = 16$

②×-1: $-2x - 2y = -16$

① $7x + 2y = 36$

$5x = 20$, $x = 4$

$2x + 2y = 16$

$2(4) + 2y = 16$

$8 + 2y = 16$

$2y = 8$

$y = 4$

4b + 2c = 50 ①

2b + 2c = 30 ②

②×-1 : $-2b - 2c = -30$

① : $4b + 2c = 50$

$2b = 20$

$b = 10$

$4b + 2c = 50$

$40 + 2c = 50$

$2c = 10$

$c = 5$

4b + c = 21 ①

2b + 3c = 13 ②

①×-3

$-12b - 3c = -63$

② $2b + 3c = 13$

$-10b = -50$

$b = 5$

$2b + 3c = 13$

$10 + 3c = 13$

$3c = 3$

$c = 1$

Starter

1) At a cinema, Charlie bought 1 ticket and 1 packet of sweets and paid £10. At the same cinema, Sam bought one ticket and 2 packets of sweets and paid £12.

How much do tickets and packets of sweets cost?

$T + S = 10$ ①

$T + 2S = 12$ ②

-2×①: $-2T - 2S = -20$

② $T + 2S = 12$

$-T = -8$

$T = 8$ $S = 2$.

2) 2 sandwiches and 3 teas cost £20. At the same restaurant, one sandwich and one tea cost £9.

How much does each item cost?

$2S + 3T = 20$ ①

$S + T = 9$ ②

-2×②: $-2S + -2T = -18$

① $2S + 3T = 20$

$T = 2$

$S + 2 = 9$

$S = 7$

2a + 3b = 40 ①

3a + 2b = 35 ②

2×①: 4a+6b=80
-3×②: -9a-6b=-105
-5a=-25
a=5
2a+3b=40
10+3b=40
3b=30
b=10

Solving Simultaneous Equations 7/10/16

- ★ Label the equations
- ★ Multiply each equation so you can cancel something out
- ★ Add the equations together
- ★ Solve
- ★ Substitute to find the other unknown

e.g. 1) 7b - 5c = 35 ①

9b - 4c = 45 ②

4×①: 28b-20c=140
-5×②: -45b+20c=-225
-17b=-85
b=5
7b-5c=35
35-5c=35
-5c=0
c=0

2) $2x + 3y = 7$ ①
$4x + 5y = 12$ ②

-2×①: -4x-6y=-14
②: 4x+5y=12
-y=-2
y=2
2x+3y=7
2x+6=7
2x=1
x=1/2

Starter

1) Simplify as much as possible:

a) $\frac{2x^2+10x+12}{2x+6}$

$=\frac{2(x^2+5x+6)}{2(x+3)}$
$=\frac{2(x+3)(x+2)}{2(x+3)}$
$=x+2$

b) $\sqrt[3]{c^4} \times \frac{1}{\sqrt[3]{c}}$

$=c^{4/3} \times \frac{1}{c^{1/3}}$
$=c^{4/3} \times c^{-1/3}$
$=c^{3/3}$
$=c$

c) $\sqrt{40}-\sqrt{90}$

$=\sqrt{4\times10}-\sqrt{9\times10}$
$=2\sqrt{10}-3\sqrt{10}$
$=-\sqrt{10}$

Today's Learning:

Practising exam type questions.