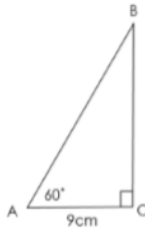


## LETS GET READY – FOUNDATION PLUS - SOLUTIONS

1<sup>st</sup> May

Find the length of side AB



$$AB = 9 \div \cos 60$$

$$\cos 60 = \frac{1}{2}$$

$$AB = 9 \div \frac{1}{2} = \mathbf{18\text{cm}}$$

2<sup>nd</sup> May

(a)  $\frac{5}{8}$  of a number is 75. What is the number?

(b) 16% of a number is 28. What is the number?

(a)  $\frac{1}{8} = 75 \div 5 = 15$  Number =  $15 \times 8 = 90$

(b)  $16\% = 28$      $4\% = 7$      $100\% = 4\% \times 25 = 7 \times 25 = 175$

3<sup>rd</sup> May

A café has a choice of two main dishes, fish and chips or cheese pie. It has a choice of three deserts – apple pie, chocolate brownie or ice cream. People choose a main course and a desert as part of a deal the café offers.

Write down all the possible combinations of dishes that could be chosen.

FC/AP

FC/CB

FC/IC

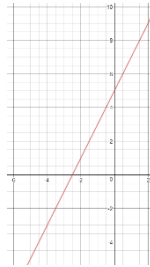
CP/AP

CP/CB

CP/IC

4<sup>th</sup> May

Draw the graph of  $y - 2x = 5$  between  $x = -5$  and  $x = 2$



5<sup>th</sup> May

Find the answer to

$$\left(5\frac{3}{5} - 2\frac{1}{6}\right) \div 1\frac{2}{5}$$

$$\left(\frac{28}{5} - \frac{13}{6}\right) \div \frac{7}{5} = \left(\frac{168}{30} - \frac{65}{30}\right) \times \frac{5}{7} = \frac{103}{30} \times \frac{5}{7} = \frac{103}{42}$$

6<sup>th</sup> May

A survey of students in a Y11 class done to find the favourite football team.

9 said Sheffield Wednesday

4 said Manchester United

5 said Liverpool

13 said Sheffield United

5 said they didn't like any team.

(a) Draw a pie-chart to illustrate the information.

(b) A student is picked at random. What is the probability they support Liverpool?

Frequency = 36    1 person =  $360^\circ \div 36 = 10^\circ$

SW =  $9 \times 10 = 90^\circ$

MU =  $4 \times 10 = 40^\circ$

Liv =  $5 \times 10 = 50^\circ$

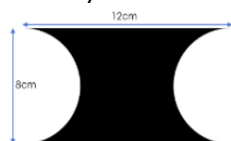
SU =  $13 \times 10 = 130^\circ$

None =  $5 \times 10 = 50^\circ$



■ SW ■ MU ■ Liv ■ SU ■ None

7<sup>th</sup> May



The diagram shows a rectangle with two semi-circles removed from the sides.

Giving your answers in terms of  $\pi$ ,  
(a) Find the perimeter of the shape  
(b) Find the area of the shape

(a) Curved lengths = circumference of 1 circle =  $8\pi$

Perimeter =  $12 + 12 + 8\pi = \mathbf{24 + 8\pi \text{ cm}}$

(b) Area of rectangle =  $12 \times 8 = 96\text{cm}^2$

2 semi-circles = 1 circle Area =  $\pi \times 4^2 = 16\pi$

Shaded area =  $\mathbf{96 - 16\pi \text{ cm}^2}$

8<sup>th</sup> May

- (a) Expand and fully simplify  $(x + 5)(x - 2)$   
 (b) Factorise fully  $x^2 + 9x - 36$   
 (c) Using your answer to part (b) solve  $x^2 + 9x - 36 = 0$
- (a)  $x^2 - 2x + 5x - 10 = x^2 + 3x - 10$   
 (b)  $(x + 12)(x - 3)$   
 (c)  $x = -12$  and  $x = 3$

10<sup>th</sup> May

The ratio of a : b is 5 : 9  
 The ratio of b : c is 4 : 11.  
 Write the ratio of a : b : c where a, b and c are integers and a : b : c is a ratio in its simplest form.

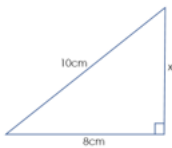
$a : b = 5 : 9 = \frac{5}{9} : 1$   
 $b : c = 4 : 11 = 1 : \frac{11}{4}$   
 $a : b : c = \frac{5}{9} : 1 : \frac{11}{4}$  Common denominator =  $9 \times 4 = 36$   
 $\times 36$ :  **$a : b : c = 20 : 36 : 99$**

11<sup>th</sup> May

- (a) Find the nth term of the sequence 9, 16, 23, 30, 37, ...  
 (b) Bill says that 261 is in the sequence. Is he right? Explain your answer.

(a) nth term =  $7n + 2$   
 (b)  $7n + 2 = 261$        $7n = 259$        $n = 37$   
 Yes it is the 37<sup>th</sup> term

12<sup>th</sup> May



- (a) Find the size of length x.  
 (b) Find the perimeter and area of the triangle.

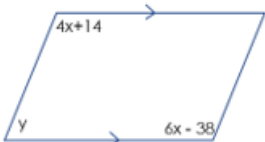
(a)  $x^2 + 8^2 = 10^2$        $x^2 + 64 = 100$        $x^2 = 36$        $x = 6$   
 (b) Perimeter =  $10 + 8 + 6 = 24\text{cm}$   
 Area =  $\frac{1}{2} \times 8 \times 6 = 24\text{cm}^2$

13<sup>th</sup> May

If  $\begin{pmatrix} 5a + 2b \\ 2a - 3b \end{pmatrix} = 4 \begin{pmatrix} 3 \\ 5 \end{pmatrix}$  find the values of a and b

$5a + 2b = 12$  (1)       $2a - 3b = 20$  (2)  
 (1) $\times 2$ :  $10a + 4b = 24$  (3)      (2) $\times 5$ :  $10a - 15b = 100$  (4)  
 (3) - (4):  $19b = -76$        **$b = -4$**   
 Sub in (1):  $5a - 8 = 12$        $5a = 20$        **$a = 4$**

14<sup>th</sup> May



The diagram shows a parallelogram.  
 Find the value of y.

$4x + 14 = 6x - 38$        $14 = 2x - 38$        $52 = 2x$        $x = 26$   
 $y = 180 - (4(26) + 14) = 180 - 118 = 62^\circ$

15<sup>th</sup> May

- (a) Find  $0.48 \times 9.8$   
 (b) Use your answer to write down what £9.80 would be after a 52% reduction.

$48 \times 98 = \begin{array}{r} 48 \\ \times 98 \\ \hline 368 \\ 4732 \\ \hline 4704 \end{array}$        $0.48 \times 9.8 = 4.704$   
 (b) 52% reduction = 48% of £9.80 =  $0.48 \times 9.8 = \text{£}4.70$

## 16<sup>th</sup> May

- (a) Write 260 as a product of prime factors  
Hence, or otherwise  
(b) Find the highest common factor of 260 and 200  
(c) Find the lowest common multiple of 260 and 300

(a)  $260 = 2 \times 2 \times 5 \times 13$  or  $2^2 \times 5 \times 13$   
 (b)  $200 = 2 \times 2 \times 2 \times 5 \times 5$   
 $260 = 2 \times 2 \times 5 \times 13$   
 $\text{HCF} = 2 \times 2 \times 5 = 20$   
 (c)  $200 = 2 \times 2 \times 2 \times 5 \times 5$   
 $260 = 2 \times 2 \times 5 \times 13$   
 $\text{LCM} = 2 \times 2 \times 2 \times 5 \times 5 \times 13 = 2600$

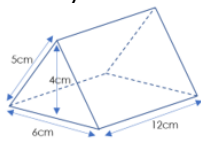
## 17<sup>th</sup> May

Solve the following equations

(a)  $5x = 60$   
 (b)  $8x - 3 = 29$   
 (c)  $5x + 2 = 9x - 11$

(a)  $x = 12$   
 (b)  $8x = 32$        $x = 4$   
 (c)  $2 = 4x - 11$      $13 = 4x$        $x = 13/4$

## 18<sup>th</sup> May



The diagram shows an isosceles triangular prism.  
Find the volume and surface area of the prism.

Cross Section =  $\frac{1}{2} \times 6 \times 4 = 12\text{cm}^2$     Volume =  $12 \times 12 = 144\text{cm}^3$   
 Surface area =  $2(12) + 2(12 \times 5) + (12 \times 6) = 216\text{cm}^2$

## 19<sup>th</sup> May

Estimate the answer to  

$$\frac{891 \times 6.33}{0.481}$$

$891 \approx 900$        $6.33 \approx 6$        $0.481 \approx 0.5$   

$$\frac{900 \times 6}{0.5} = \frac{5400}{0.5} = 10800$$

Showing clearly how you came by your estimate.

## 20<sup>th</sup> May

The population of Hillsborough is declining at a rate of 10% each year. Currently the population of Hillsborough is 27,000.

- (a) What was the population last year?  
 (b) What will the population be next year if this decline continues?

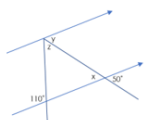
(a) Last year  $\rightarrow \times 0.9 \rightarrow$  Next Year  
 Next year  $\rightarrow \div 0.9 \rightarrow$  Last year  
 $27000 \rightarrow \div 0.9 \rightarrow 30,000$   
 (b)  $30,000 \div 0.9 = 300000 \div 9 = 33,333$

## 21<sup>st</sup> May

Solve the pair of simultaneous equations  
 $9x + 5y = 26$   
 $5x - 7y = 34$

$9x + 5y = 26$  (1)       $5x - 7y = 34$  (2)  
 (1) $\times 5$ :  $45x + 25y = 130$  (3)      (2) $\times 9$ :  $45x - 63y = 306$  (4)  
 (3) - (4):  $88y = -176$        $y = -2$   
 Sub in (1):  $9x + 5(-2) = 26$        $9x - 10 = 26$      $x = 4$

## 22<sup>nd</sup> May



Find the size of angles  $x$ ,  $y$  and  $z$  giving correct geometrical reasons each time. (Diagram not drawn accurately)

$x = 50^\circ$  (Vertically opposite angles are equal)  
 $y = 50^\circ$  (Corresponding angles are equal)  
 $z = 110 - 50^\circ = 60^\circ$  (Alternate angles are equal)

## 23<sup>rd</sup> May

Evaluate:

- (a)  $8 + 2 \times 3 + 5$   
 (b)  $6^{-2}$   
 (c)  $(3 \times 10^3) \times (1.5 \times 10^5)$  (give your final answer in standard form)

(a)  $8 + 6 + 5 = 19$   
 (b)  $\frac{1}{6^2} = \frac{1}{36}$   
 (c)  $(3 \times 1.5) \times (10^3 \times 10^5) = 4.5 \times 10^8$

## 25<sup>th</sup> May

(a) 8km = 5 miles.

The ratio of km to miles can be written in the form  $\frac{1}{n}$ .

What would the value of n be?

(b) A map uses the scale  $\frac{1}{200,000}$ . A distance on a map measures 8.1 cm.

How far is this in real life? Give your answer in miles.

$$(a) 8 : 5 = 1 : \frac{5}{8} = 1 : 0.625$$

$$(b) 8.1 \times 200000 = 1620000 \text{ cm} = 16200 \text{ m} = 16.2 \text{ km}$$

$$1 \text{ km} = 0.625 \text{ miles}$$

$$16.2 \text{ km} = 16.2 \times 0.625 = 10.125 \text{ miles}$$

## 26<sup>th</sup> May

A bag has 5 red balls, 3 white balls and 4 black balls.

Susan picks a ball at random, notes the colour and puts it back in the bag. She then picks another ball.

What is the probability that she picks two balls that are the same colour?

$$\text{Both Red} = \frac{5}{12} \times \frac{5}{12} = \frac{25}{144} \quad \text{Both White} = \frac{3}{12} \times \frac{3}{12} = \frac{9}{144}$$

$$\text{Both Black} = \frac{4}{12} \times \frac{4}{12} = \frac{16}{144}$$

$$P(\text{Same Colour}) = \frac{25}{144} + \frac{9}{144} + \frac{16}{144} = \frac{50}{144}$$

## 27<sup>th</sup> May

Joan invested £5000 in a bank account three years ago. The bank pays x% compound interest per year.

She currently has £5431.87 in her account. She has not withdrawn or deposited any more money. Find the value of x to 1 decimal place.

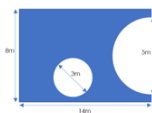
$$5431.87 = 5000m^3$$

$$m^3 = 1.086374$$

$$m = 1.028 = 102.8\%$$

$$x = 2.8\%$$

## 28<sup>th</sup> May



The diagram shows the plan of a garden which has a semi-circular section of decking and a circular pond. The shaded area is to be grassed. Boxes of grass seed cover  $2.5 \text{ m}^2$  and cost £5.99 each. How much will it cost to grass the garden?

$$\text{Rectangle} = 14 \times 8 = 112 \text{ m}^2$$

$$\text{Semi Circle} = \frac{1}{2} \times \pi \times 2.5^2 = 9.82 \text{ m}^2$$

$$\text{Circle} = \pi \times 1.5^2 = 7.07 \text{ m}^2$$

$$\text{Total Area to be grassed} = 112 - 9.82 - 7.07 = 95.11 \text{ m}^2$$

$$\text{Boxes needed} = 95.11 \div 2.5 = 38.044 = 39 \text{ boxes}$$

$$\text{Cost} = 39 \times £5.99 = \mathbf{£233.61}$$

## 29<sup>th</sup> May

The table shows the times 106 shoppers spent in a supermarket.

Time (t minutes)	Frequency
$0 < t \leq 10$	20
$10 < t \leq 20$	17
$20 < t \leq 30$	12
$30 < t \leq 40$	32
$40 < t \leq 50$	25

Find the group the median lies in and estimate the mean time.

Median = 53<sup>rd</sup> and 54<sup>th</sup> piece of data.

Both lie in the  $30 < t \leq 40$  group

$$\text{Mean} = \frac{(20 \times 5) + (17 \times 15) + (12 \times 25) + (32 \times 35) + (25 \times 45)}{106} = \frac{2900}{106} = 27.36$$

## 30<sup>th</sup> May

(a) Increase £27.50 by 18%

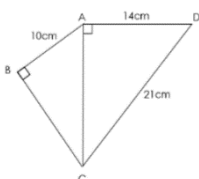
(b) Ian bought a car for £12,640.

Two years later he sold it for £9,950. Work out the percentage loss he made.

$$(a) 27.5 \times 1.18 = \mathbf{£32.45}$$

$$(b) \% \text{ loss} = \frac{12640 - 9950}{12640} \times 100 = \mathbf{21.3\%}$$

## 31<sup>st</sup> May



Find the size of angle BAC

$$AC^2 + 14^2 = 21^2 \quad AC^2 + 196 = 441 \quad AC = \sqrt{245}$$

$$\cos BAC = \frac{10}{\sqrt{245}} \quad BAC = \cos^{-1} \left( \frac{10}{\sqrt{245}} \right) = \mathbf{50.29^\circ}$$

### 1<sup>st</sup> June

Mr and Mrs Smith are taking their three children on a train journey. Adult return tickets are £4.50 more expensive than child tickets. To total cost of all the return tickets is £72.50. What is the cost of each type of ticket?

$$\begin{aligned} \text{Child ticket} &= x & \text{Adult ticket} &= x + 4.5 \\ 2(x + 4.5) + 3x &= 72.5 \\ 2x + 9 + 3x &= 72.5 & 5x &= 63.5 \\ x &= 12.7 & \text{Child Ticket} &= \mathbf{\pounds 12.70} & \text{Adult Ticket} &= \mathbf{\pounds 17.20} \end{aligned}$$

### 2<sup>nd</sup> June

Paul is going on a trip to Europe. He takes with him £800. He is staying for 3 days and his travel and accommodation has already been paid for. He spends €80 each day for food and drink. He spends another €250 at the airport on duty free. If the exchange rate is £1 = €1.21, how many pounds does he receive when he converts his money back again?

$$\begin{aligned} \pounds 800 &= 800 \times 1.21 = \mathbf{\pounds 968} \\ \text{Euro's Left} &= 968 - 3(80) - 250 = \mathbf{\pounds 478} \\ \text{Pounds} &= 478 \div 1.21 = \mathbf{\pounds 395.04} \end{aligned}$$

### 3<sup>rd</sup> June

A recipe for Shortbread biscuits makes 20 biscuits:  
125g butter  
55g caster sugar  
180g plain flour.  
(a) How much of each ingredient is required for 12 biscuits?  
(b) I have 240g of plain flour and loads of butter and caster sugar. What is the largest number of shortbread biscuits I could make?

$$\begin{aligned} \text{(a) Scale Factor} &= 12 \div 20 = 0.6 \\ \text{Butter} &= 125 \times 0.6 = \mathbf{75g} \\ \text{Caster Sugar} &= 55 \times 0.6 = \mathbf{33g} \\ \text{Plain Flour} &= 180 \times 0.6 = \mathbf{108g} \\ \text{(b) } 240 \div 180 &= 4/3 (1.333) \times 20 = 26.66... = \mathbf{27 \text{ biscuits}} \end{aligned}$$