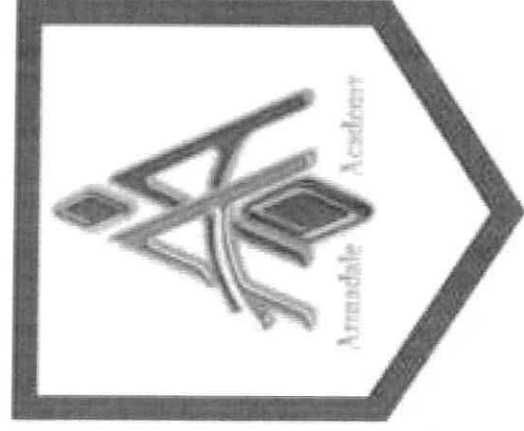


# Armadale Academy



## S2 Maths Revision Booklet

### **How to use this booklet:**

There are questions on each topic that has been covered so far in the S2 mathematics course as well as some revision from S1.

Next to each set of questions is a QR code which you can scan with your phone.

These QR codes will take you videos with explanations of how to answer the questions if you are unsure.

# 1. Number Work

## Four Operations with Whole Numbers and Decimals

1. Use an appropriate strategy to calculate:

- a)  $67 + 18$  **85**    b)  $27 + 21$  **48**    c)  $123 + 564$  **687**    d)  $2385 + 584$  **2969**  
 e)  $39104 + 22934$  **62038**    f)  $81 - 43$  **38**    g)  $557 - 319$  **238**    h)  $982 - 93$  **889**  
 i)  $9000 - 1182$  **7818**    j)  $48832 - 14501$  **34331**    k)  $432 + 217 - 119$  **530**    l)  $5000 - 231 + 190$  **4959**  
 m)  $6.28 + 3.1$  **9.38**    n)  $9.98 - 4.56$  **5.42**    o)  $7 - 4.56$  **2.44**    p)  $15.3 + 21.46$  **36.76**



Column Addition



Partitioning Addition



Empty Number Line Addition

2. At a football match there are 2942 Rovers fans and 9381 City fans.

How many more fans did City have? **6439 fans**

3. This table shows the lengths of three rivers.

River	Length in kilometres
Nile	6,853
Thames	346
Mississippi	3,734



Column Subtraction



Partitioning Subtraction



Empty Number Line Subtraction

How much longer is the Nile than the combined lengths of the other two rivers?

**2773 km**

4. The distances, in kilometres, between four towns are shown on the map.



a) Work out the distance between Leek and Dale. **106 km**

b) Work out the distance between Milton and Dale. **160 km**

5. Complete the calculations to find the missing digits:

a) 
$$\begin{array}{r} 4 \boxed{8} \\ + \boxed{2} \boxed{4} \\ \hline 7 \boxed{2} \end{array}$$

b) 
$$\begin{array}{r} 5 \boxed{6} \boxed{3} \\ + \boxed{3} \boxed{7} \boxed{1} \\ \hline 9 \boxed{3} \boxed{4} \end{array}$$

c) 
$$\begin{array}{r} 5 \ 4 \ 7 \\ - \boxed{1} \boxed{7} \boxed{8} \\ \hline \boxed{3} \boxed{6} \boxed{9} \end{array}$$

6. Use an appropriate strategy to calculate:

- a)  $79 \times 8$  **632**    b)  $32 \times 9$  **288**    c)  $902 \times 6$  **5412**    d)  $1236 \times 8$  **9888**  
 e)  $336 \div 8$  **42**    f)  $657 \div 9$  **73**    g)  $1382 \div 4$  **345.5**    h)  $1273 \div 6$  **212.1666...**  
 i)  $7.8 \times 5$  **39**    j)  $19.82 \div 4$  **4.955**    k)  $0.03 \times 7$  **0.21**    l)  $0.021 \div 7$  **0.003**



Grid Method Multiplication



Column Multiplication

7. How many days are there in 35 weeks? **245 days**

8. At a wedding, there are 16 tables. 15 tables seat 6 guests.

1 table will seat 6 guests.

Work out the total number of chairs needed.

**98 chairs**



Short Division

9. Leanne works in a cinema.

She is paid £7.25 per hour for the first 90 hours she works each month. Leanne is paid an overtime rate of £9 per hour for any additional hours. In September she works 138 hours.

Work out how much Leanne is paid.  $\pounds 1084.50$

10. A school has 5 year groups and 835 students in total. Each year group has an equal number of students.

How many students are in each year group?  $167$  students

11. Leah bought a new car costing £18,000. She paid a deposit of £2,000.

Leah paid the rest of the money over 50 equal monthly payments.

How much was each monthly payment?  $\pounds 320$

12. Sally is paid £8 per hour.

In one week she is paid £264.

How many hours did Sally work?  $33$  hours

13. Use an appropriate strategy to calculate:

a)  $79 \times 13$   $1027$     b)  $32 \times 29$   $928$     c)  $902 \times 46$   $41492$     d)  $1236 \times 85$   $105060$

e)  $288 + 18$   $16$     f)  $956 + 23$   $42$     g)  $2352 + 56$   $42$     h)  $7410 \div 95$   $78$

14. Felicity spends 25 minutes reading every day.

$775$  minutes

How long does she spend reading during the month of May?  $12$  hours  $55$  mins

15. The product of Jack's age and Florence's age is 266. Jack is 14 years old. How old is Florence?  $19$  years old

16. A rugby team brought 18 coaches of supporters to a cup match. Each coach holds 53 passengers.

How many supporters are brought to the cup match by the 18 coaches?  $954$  supporters

17. Jenny bought a motorbike.

She paid a deposit of £345 and 36 monthly payments of £44. At the end of the payments, she sold the motorbike for £1400. How much did it cost Jenny in total?  $\pounds 1929$

18. A theatre has 28 seats in each row. There are 1036 seats in total. How many rows are there?  $37$

### Multiplying and Dividing by 10, 100, 1000

1. Calculate:

a)  $79 \times 10$   $790$

b)  $324 \times 1000$   $324000$

c)  $9.2 \times 100$   $920$

d)  $12.36 \times 1000$   $12360$

e)  $2800 \div 100$   $28$

f)  $966 \div 10$   $96.6$

g)  $235200 \div 1000$   $235.2$

h)  $741 \div 1000$   $0.741$

2. Calculate:

a)  $79 \times 40$   $3160$

b)  $324 \times 8000$   $2592000$

c)  $9.2 \times 300$   $2760$

d)  $12.36 \times 7000$   $86520$

e)  $2800 \div 400$   $7$

f)  $966 \div 20$   $48.3$

g)  $235200 \div 8000$   $29.4$

h)  $741 \div 3000$   $0.247$



Long  
Multiplication  
(Column)



Long  
Division



Multiplying and  
Dividing by 10,  
1000 and 1000



Multiplying and  
Dividing by  
multiples of  
10, 1000 and  
1000

## Rounding

### 1. Round to the nearest 10

- (a) 121   120   (b) 146   150   (c) 164   160   (d) 185   190  
(e) 292   290   (f) 238   240   (g) 312   310   (h) 333   330

### 2. Round to the nearest 100

- (a) 1430   1400   (b) 1280   1300   (c) 1610   1600   (d) 1550   1600  
(e) 4030   4000   (f) 6080   6100   (g) 7420   7400   (h) 8160   8200

### 3. Round to the nearest 1000

- (a) 21800   22000   (b) 18300   18000   (c) 17600   18000   (d) 19200   19000  
(e) 11590   12000   (f) 16350   16000   (g) 24500   25000   (h) 34800   35000

### 4. Round to 1 decimal place

- (a) 5.191   5.2   (b) 8.246   8.2   (c) 10.087   10.1   (d) 39.555   39.6   (e) 0.031   0.0  
(f) 93.2941   93.3   (g) 38.3152   38.3   (h) 7.26229   7.3   (i) 0.54868696   0.5

### 5. Round to 2 decimal places

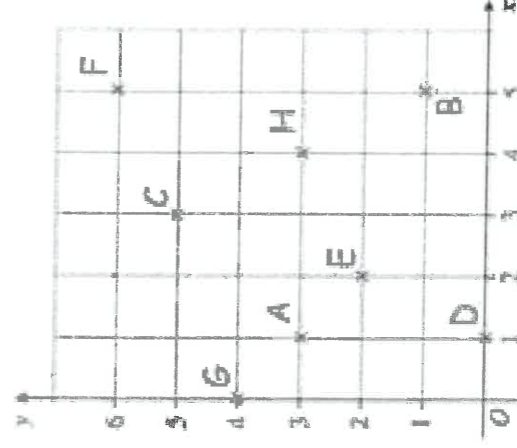
- (a) 3.487   3.49   (b) 2.613   2.61   (c) 1.984   1.98   (d) 10.046   10.05   (e) 8.155   8.16  
(f) 19.367   19.37   (g) 3.141   3.14   (h) 6.0698   6.07   (i) 4.26317   4.26   (j) 93.46197   93.46

### 6. Round to 3 decimal places

- (a) 0.0346   0.035   (b) 6.7568   6.757   (c) 4.2251   4.225   (d) 1.7583   1.758  
(e) 40.48546   40.485   (f) 128.01891   128.019   (g) 0.5059802   0.506   (h) 384.456094   384.456

## 2. Coordinates

Question 1: Write down the coordinates of the points A, B, C, D, E, F, G and H.



- A(1,3)  
B(5,1)  
C(3,5)  
D(1,0)  
E(2,2)  
F(5,6)  
G(0,4)  
H(4,3)



Rounding to the nearest 10



Rounding to the nearest 100



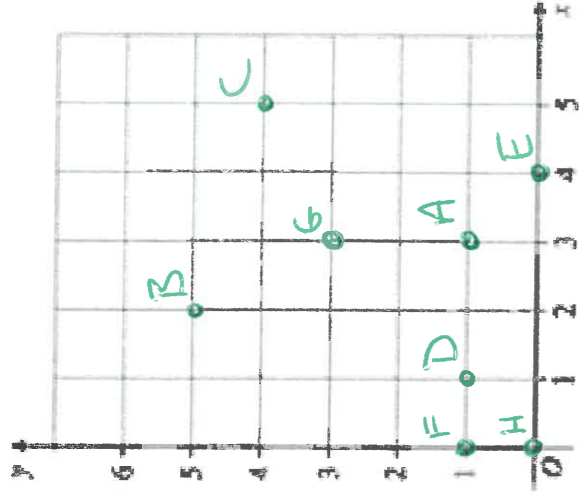
Rounding to decimal places



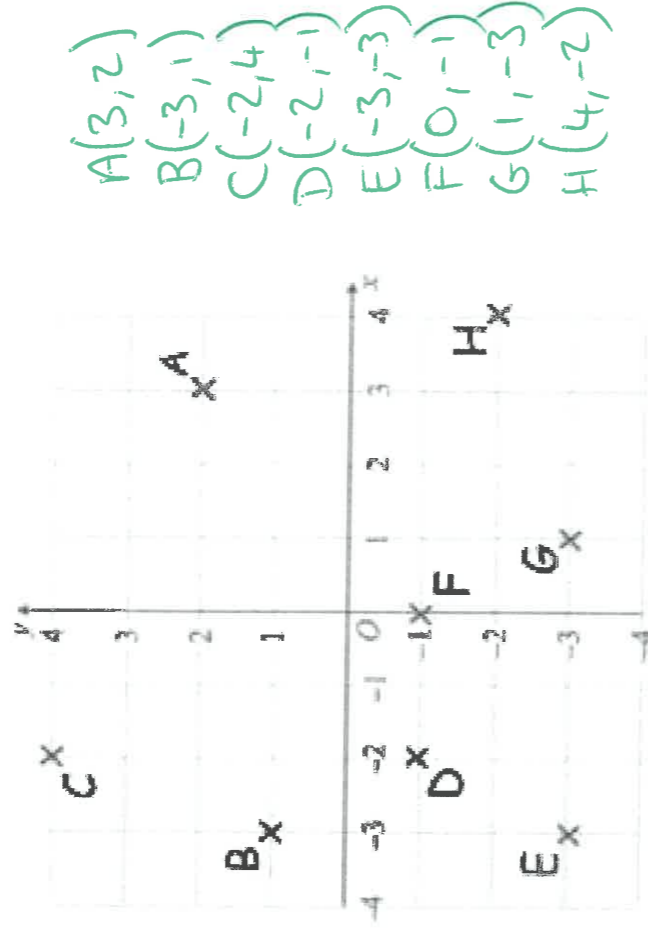
Coordinates

Question 2: Make a copy of the grid shown and then plot the points:

- (a) A (3, 1)
- (b) B (2, 5)
- (c) C (5, 4)
- (d) D (1, 1)
- (e) E (4, 0)
- (f) F (0, 1)
- (g) G (3, 3)
- (h) H (0, 0)

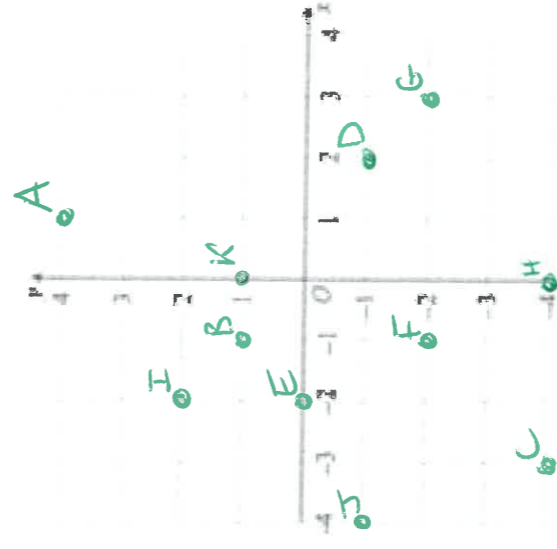


Question 3: Write down the coordinates of the points A, B, C, D, E, F, G and H.



Question 4: Make a copy of the grid shown and then plot the points:

- (a) A (1, 4)
- (b) B (-1, 1)
- (c) C (-3, -4)
- (d) D (2, -1)
- (e) E (-2, 0)
- (f) F (-1, -2)
- (g) G (3, -2)
- (h) H (0, -4)
- (i) I (-2, 2)
- (j) J (-4, -1)
- (k) K (0, 1)



### 3. Sequences and Patterns

#### Sequences

1. The rule for the sequence below is "multiply by 2 then add 5."

1, 7, 19, 43,.....

What is the next number in this sequence? **91**

2. The rule for the sequence below is "multiply by 3 then add 1."

2, 7, 22, 67,.....

**202**

What is the next number in this sequence?

3. The rule for the sequence below is "multiply by 4 then subtract 2."

1, 2, 6, 22,.....

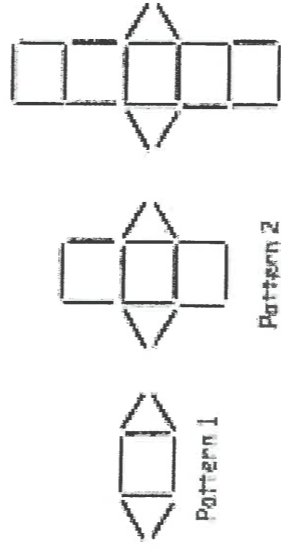
**86**

What is the next number in this sequence?

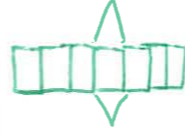
#### Patterns

Question 1: The patterns below are made from sticks

(a) Complete the table for pattern 4.



Pattern Number	1	2	3	4
Number of Sticks	4	14	20	<b>26</b>



(b) Sketch pattern 5.

Here is a rule for working out the number of sticks

**Multiply pattern number by 6 and add 2**

(c) How many sticks will be in pattern 30?

**182**

(d) How many sticks will be in pattern 120?

**722**

(e) Which pattern will have 80 sticks?

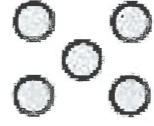
**13**

(f) Which pattern will have 482 sticks?

**80**

Question 2: The diagram shows a sequence of patterns

(a) Draw pattern 4.



Pattern 1

**1**

Pattern 2

**5**

Pattern 3

**9**

**13**

(b) Work out the number of circles in pattern 5.

**17**

(c) Write down a rule for continuing the patterns.

(d) Explain why you cannot make a pattern with exactly 66 circles.

(e) Complete this rule  
*The number of circles will always be odd when you multiply by 2 then subtract 1.*

Number of circles = Pattern number  $\times$   -



Sequences



Patterns

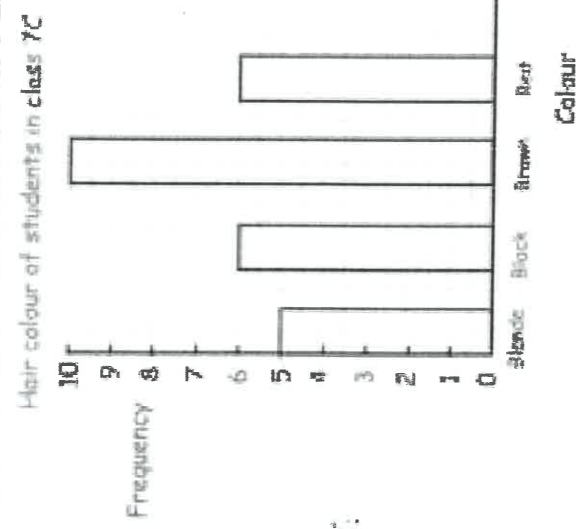
## 4. Information Handling

### Bar Graphs



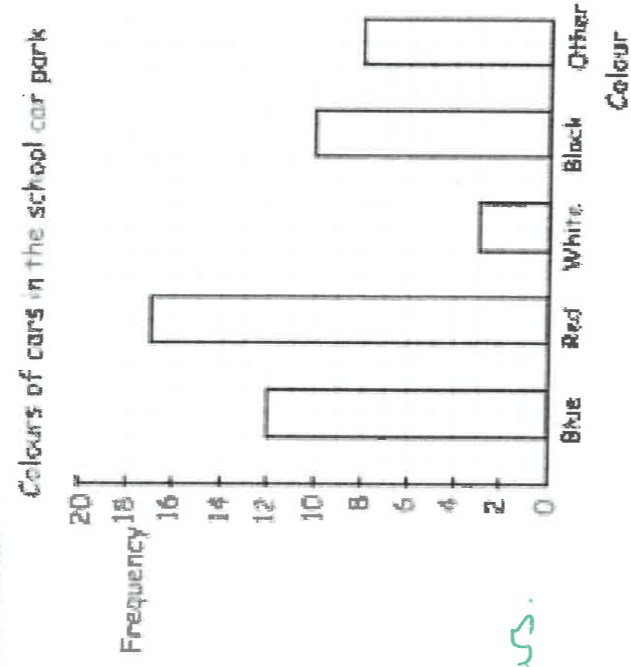
Reading Bar  
Graphs

Question 1: The bar chart shows information about the hair colour of students in 7C.



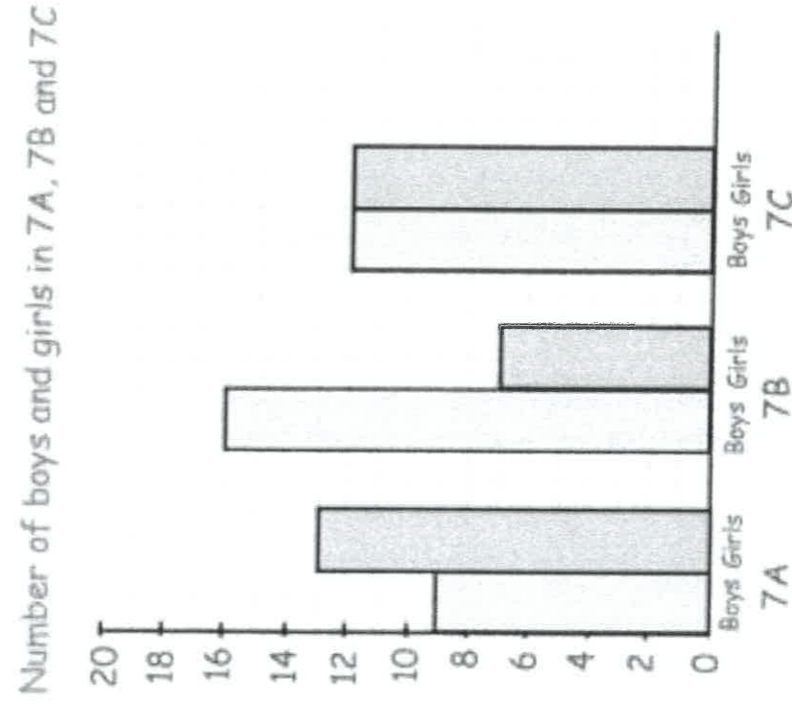
- (a) What is the most common hair colour in 7C?  
*Brown*
- (b) How many students had black hair?  
*9*
- (c) What hair colour is the least popular in 7C?  
*Blonde*
- (d) How many more students had brown than red hair?  
*2*
- (e) How many students are in 7C?  
*27*

Question 2: Nicole recorded the colours of cars in a car park. She then drew a bar chart to show the results.



- (a) What is the most common colour of car?  
*Red*
- (b) How many cars were blue?  
*12*
- (c) How many cars were white?  
*10*
- (d) How many more cars were red than black?  
*8*
- (e) Why do you think there is a bar called "other"?  
*For other, less popular, colours.*
- (f) How many cars were in the car park?  
*52*

Question 3: The dual bar chart shows information about the number of boys and girls in three tutor groups, 7A, 7B and 7C.



- (a) How many boys are there in 7B?  
*15*
- (b) Which tutor group has 12 girls?  
*7C*
- (c) Which tutor group has more girls than boys?  
*7A*
- (d) Which tutor group has the same number of boys and girls?  
*7C*
- (e) Which tutor group has the most students?  
*7C*
- (f) How many more girls than boys are there in 7A?  
*4*
- (g) How many boys are there in Year 7?  
*37*
- (h) How many students are there in Year 7?  
*69*

## Line Graphs



Question 1: Draw a line graph for each of the following tables

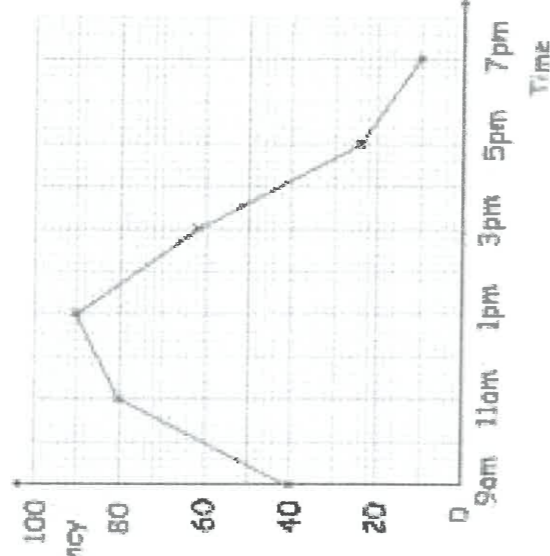
(a)		(b)		(c)	
Year	Population	Time	Price	Month	Height, cm
1990	40	9am	30p	1	3
1995	44	10am	24p	2	5
2000	50	11am	25p	3	10
2005	62	12 noon	27p	4	20
2010	88	1pm	37p	5	35
2015	90	2pm	38p	6	36

Show Teacher

Show Teacher

Show Teacher

Question 2: Sally recorded the number of cars in a car park every two hours. She began at 9am and finished at 7pm. The line graph shows her results.

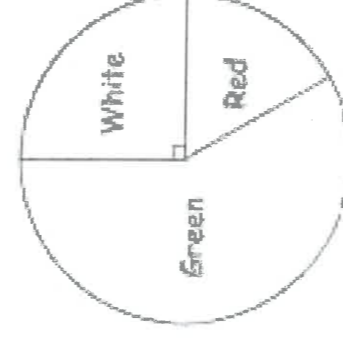


- (a) When were the most cars in the car park?  
*1pm*
- (b) How many cars were in the car park at 11am?  
*80*
- (c) At what time were there 24 cars in the car park?  
*5pm*
- (d) Estimate the number of cars in the car park at 10am.  
*~60*
- (e) How many less cars were in the car park at 3pm than 1pm?  
*~28*

## Pie Charts

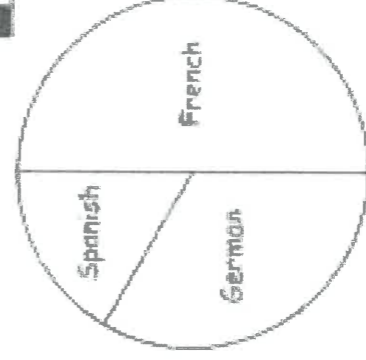
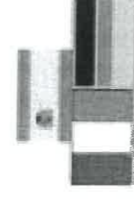


Question 1: This pie chart shows the colour of sweets in a bag.



- (a) What is the most common colour of sweet?  
*Green*
- (b) What is the least common colour of sweet?  
*Red*
- (c) What fraction of the sweets are white?  
*1/4*

Question 2: The students in a school study one language. The pie chart shows the languages studied.



- (a) What is the most popular language?  
*French*
- (b) What is the least popular language?  
*Spanish*
- (c) What fraction of the students studied French?  
*1/3*

There are 300 students that attend the school.

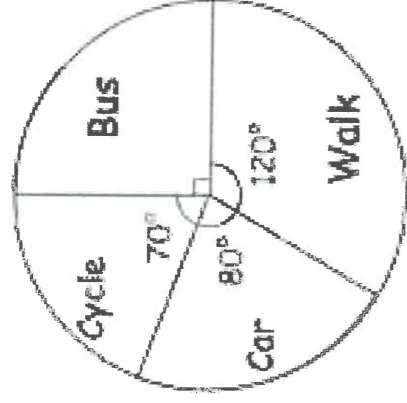
- (d) How many students study French?

*1/3 of 300 = 150 students*



Question 3: The pie charts shows how a group of students travel to school.

- (a) What is the most common method of travel?
- (b) What is the least common method of travel?
- (c) What fraction of the students caught the bus?
- (d) What fraction of the students walked?



There are 36 students in the group.

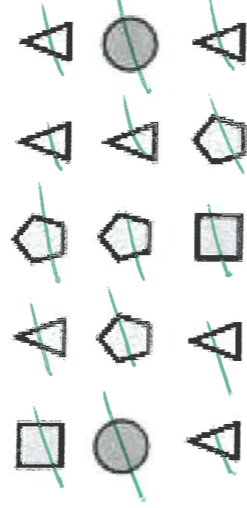
- (e) How many students caught the bus?  
 $\frac{1}{4}$  of 36 = 9 students
- (f) How many students walked?  
 $\frac{1}{3}$  of 36 = 12 students



### Frequency Tables (Tally Charts)

Question 1: Copy and complete the tally chart

Shape	Tally	Frequency
Circle		2
Pentagon		4
Square		2
Triangle		7



Question 2: Dara has recorded how many tries he scored in 25 rugby matches  
Copy and complete the tally chart

<del>1</del>	<del>2</del>	<del>0</del>	<del>0</del>	<del>1</del>
<del>0</del>	<del>1</del>	<del>0</del>	<del>2</del>	<del>0</del>
<del>0</del>	<del>3</del>	<del>0</del>	<del>1</del>	<del>0</del>
<del>0</del>	<del>1</del>	<del>2</del>	<del>1</del>	<del>2</del>
<del>0</del>	<del>1</del>	<del>1</del>	<del>1</del>	<del>0</del>

Number of tries	Tally	Frequency
0		11
1		9
2		4
3		1

Question 3: Isabelle is creating a tally chart.  
Complete the tally chart for her.

Day	Tally	Frequency
Monday		12
Tuesday		3
Wednesday		7
Thursday		19
Friday		10

Question 4: Jessica rolls a dice 30 times and records the scores.

- (a) Draw a tally chart to show her results
- (b) Which score was the most common?
- (c) Do you think the dice was fair?

<del>6</del>	<del>1</del>	<del>2</del>	<del>3</del>	<del>2</del>	<del>1</del>	<del>5</del>	<del>1</del>	<del>4</del>	<del>1</del>
<del>1</del>	<del>4</del>	<del>1</del>	<del>6</del>	<del>6</del>	<del>5</del>	<del>1</del>	<del>2</del>	<del>3</del>	<del>1</del>
<del>1</del>	<del>3</del>	<del>2</del>	<del>3</del>	<del>2</del>	<del>1</del>	<del>1</del>	<del>6</del>	<del>1</del>	<del>1</del>

No, a fair dice should have a similar amount of tallies for each possibility

Tally Charts



Roll	Tally	Freq.
1		11
2		9
3		4
4		1
5		1
6		1

## 5. Speed/Distance/Time

### Converting from hours and minutes into decimal hours

Question 1: Convert the times from hours/minutes into hours, without a calculator.

e.g. 1 45 minutes = 0.75 hours

e.g. 2 1 hour 30 minutes = 1.5 hours

- (a) 15 minutes *0.25 hrs* (b) 30 minutes *0.5 hrs* (c) 45 minutes *0.75 hrs*  
(d) 20 minutes *0.333... hrs* (e) 40 minutes *0.666... hrs* (f) 2 hours 30 minutes *2.5 hrs*  
(g) 1 hour 15 minutes *1.25 hrs* (h) 3 hours 45 minutes *3.75 hrs* (i) 2 hours 40 minutes *2.666... hrs*  
(j) 5 hours 30 minutes *5.5 hrs* (k) 7 hours 20 minutes *7.333... hrs* (l) 4 hours 15 minutes *4.25 hrs*

### Speed/Distance/Time Calculations

Question 1: Calculate the average speeds for each of the following, without using a calculator.

- (a) A car travels 60 miles in 2 hours *30 mph* (b) A lorry travels 120 miles in 3 hours *40 mph*  
(c) A cyclist travels 45 miles in 5 hours *9 mph* (d) A jogger travels 30km in 4 hours *7.5 mph*  
(e) A runner runs 100 metres in 10 seconds *10 mps* (f) A car travels 195 miles in 3 hours *65 mph*  
(g) A helicopter travels 425 miles in 5 hours *85 mph* (h) A helicopter flies 840 miles in 7 hours *120 mph*  
(i) A dog runs 216 metres in 12 seconds *18 mps* (j) An airplane travels 984 miles in 6 hours *164 mph*  
(k) A bird flies 19 miles in 2 hours *9.5 mph* (l) A car travels 600km in 8 hours *75 kph*

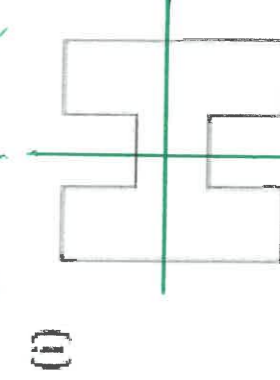
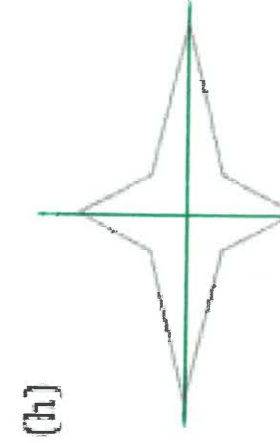
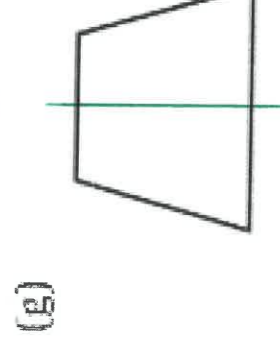
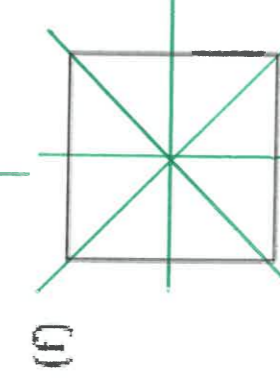
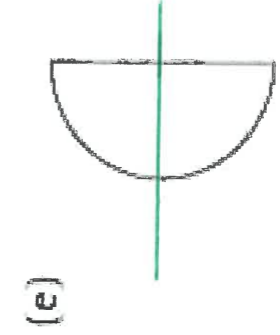
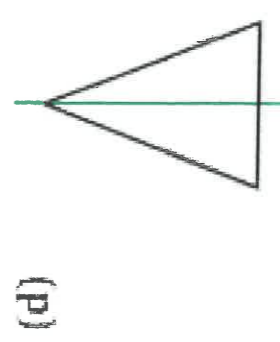
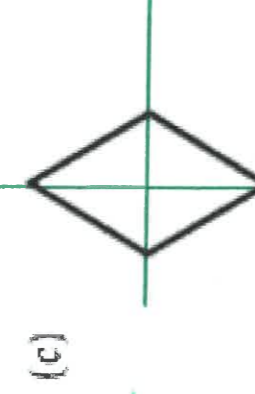
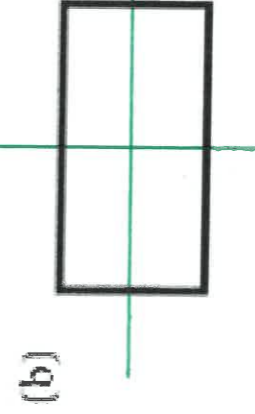
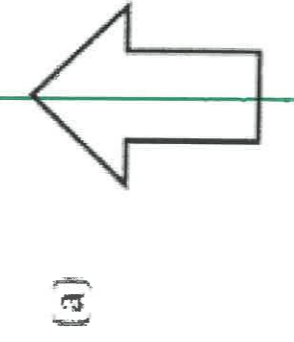
Question 2: Calculate the average speeds for each of the following, without using a calculator.

- (a) A car travels 20 miles in 30 minutes *10 miles* (b) A lorry travels 32 miles in 30 minutes *16 miles*  
(c) A bird flies 17 kilometres in 30 minutes *8.5 km* (d) A man jogs 2 kilometres in 15 minutes. *0.5 km*  
(e) A helicopter flies 18 miles in 15 minutes *6.5 miles* (f) An F1 car travels 32 miles in 15 minutes. *8 miles*

## 6. Symmetry







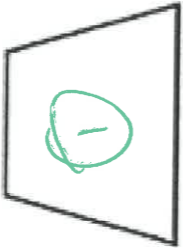
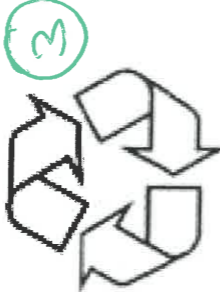

### Line Symmetry

Question 1: Draw all the lines of symmetry on each the shapes below





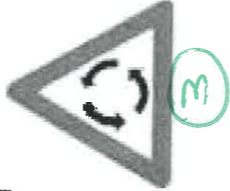


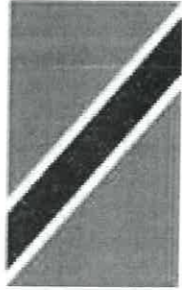
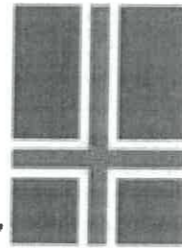
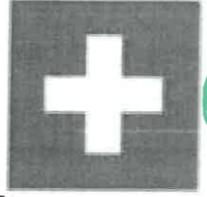
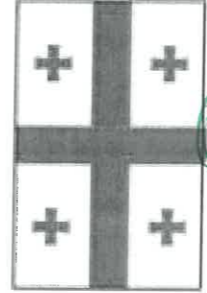
## Rotational Symmetry

Question 1: For each shape below, state the order of rotational symmetry

- (a)  (b)  (c) 
- (d)  (e)  (f) 
- (g)  (h)  (i) 

Question 2: Here are some road signs.

For each road sign, write down the order of rotational symmetry.

- (a)  (b)  (c)  (d)  (e) 
- (a)  (b)  (c)  (d) 

Question 3: Here are some flags.

For each flag, write down the order of rotational symmetry

## 7. Fractions/Decimals/Percentages

Question 1: Write these fractions as percentages

- (a)  $\frac{1}{2}$  50% (b)  $\frac{1}{4}$  25% (c)  $\frac{3}{4}$  75% (d)  $\frac{1}{5}$  20% (e)  $\frac{3}{5}$  60% (f)  $\frac{7}{10}$  70% (g)  $\frac{1}{3}$  33 1/3%

Question 2: Write these fractions as decimals

- (a)  $\frac{1}{2}$  0.5 (b)  $\frac{1}{4}$  0.25 (c)  $\frac{3}{4}$  0.75 (d)  $\frac{1}{5}$  0.2 (e)  $\frac{1}{3}$  0.333... (f)  $\frac{1}{10}$  0.1 (g)  $\frac{2}{3}$  0.666...

Question 3: Write these decimals as fractions

- (a) 0.1  $\frac{1}{10}$  (b) 0.6  $\frac{3}{5}$  (c) 0.5  $\frac{1}{2}$  (d) 0.75  $\frac{3}{4}$  (e) 0.8  $\frac{4}{5}$  (f) 0.2  $\frac{1}{5}$  (g) 0.25  $\frac{1}{4}$



Question 4: Write these decimals as percentages

- (a) 0.75 **75%** (b) 0.25 **25%** (c) 0.9 **90%** (d) 0.5 **50%** (e) 0.4 **40%** (f) 0.7 **70%** (g) 0.8 **80%**

Question 5: Write these percentages as fractions

- (a) 50%  $\frac{1}{2}$  (b) 25%  $\frac{1}{4}$  (c) 75%  $\frac{3}{4}$  (d) 10%  $\frac{1}{10}$  (e) 70%  $\frac{7}{10}$  (f) 20%  $\frac{1}{5}$  (g) 60%  $\frac{3}{5}$

Question 6: Write these percentages as decimals

- (a) 75% **0.75** (b) 90% **0.9** (c) 50% **0.5** (d) 25% **0.25** (e) 30% **0.3** (f) 40% **0.4** (g) 90% **0.9**

Question 7: Copy and complete this table

Fraction	Decimal	Percentage
$\frac{1}{2}$	<b>0.5</b>	<b>50%</b>
$\frac{4}{5}$	0.8	<b>80%</b>
$\frac{1}{3}$	<b>0.666...</b>	<b>66⅔%</b>
$\frac{3}{10}$	<b>0.3</b>	30%

## 8. Averages - Mean/Median/Mode/Range

### Mode

Question 1: Work out the mode for the each of the following

- (a) 5, 6, 6, 7, 8, 10 **6** (b) 1, 1, 1, 4, 6, 8, 12 **1** (c) 5, 5, 7, 7, 7, 8, 8, 9 **7**  
 (d) 5, 7, 3, 5, 8, 9, 10, 2 **5** (e) 8, 3, 3, 4, 6, 8, 13, 3, 18 **3** (f) 12, 14, 15, 17, 15 **15**  
 (g) 2, 3, 2, 6, 2, 8, 2, 7, 2, 4, 2, 3, 2, 1, 2, 3 **2** (h) -2, -1, 5, 8, -2, 2, -1, 9, -1, 1, 2, -1 **-1**

### Median

Question 1: Work out the median for the each of the following

- (a) 5, 1, 4, 6, 8 **5** (b) 9, 1, 3, 6, 7, 8, 9 **7** (c) 6, 4, 7, 1, 3, 8, 1, 10 **5**  
 1 4 5 6 8 1 3 6 7 8 9 9 1 3 4 6 7 8 10  
 (d) 7, 3, 8, 9, 6, 8 **6.5** (e) 9, 8, 6, 6, 7, 1, 2, 6, 8 **6** (f) -4, 8, -7, -1, 2, 0, 9 **0**  
 3 5 6 7 8 9 1 2 6 6 6 6 7 8 8 9 -7 -4 -1 0 2 5 9  
 (g) 20, 30, 10, 20, 40, 50, 60, 10, 80, 30 **30** (h) 49, 34, 12, 10, 53, 20, 65, 34, 90, 100, 34 **34**  
 10 10 20 20 30 30 40 50 60 80 10 12 20 33 34 34 49 53 65 90 100  
 (i) 6, 2, 6, 8, 6, 6, 7, 2, 6, 4, 7, 4, 5, 8 **6.6** (j) 124, 53, 39, 270, 165, 180 **139.5**  
 5.8 6.2 6.4 6.6 6.8 7.2 7.4 39 53 124.155 180 230

### Mean

Question 1: Find the mean for each of the sets of data below

- (a) 4, 9, 7, 10, 5 **7** (b) 2, 8, 6, 3, 12, 7, 4 **6** (c) 3, 2, 1, 3, 2, 2, 1, 3, 1, 2, 3, 2, 1 **2**  
 (d) 1, 8, 7, 5, 6, 4, 7, 6 **5.5** (e) 20, 30, 24, 32 **26.5** (f) 12, 8, 14, 5, 1, 3, 0, 8, 10, 11 **7.2**  
 (g) 9, -3, -6, 5, 0 **1** (h) 1.4, 2.8, 2.4, 2.5, 2.8, 3.1, 1.1 **2.3**



Finding the Mode



Finding the Median



Finding the Mean

## Range



Finding the Range

Question 1: Find the range for each of the following

- (a) 5, 9, 1, 5, 7, 4, 3      (b) 6, 7, 10, 8, 9, 9      (c) 21, 15, 19, 24, 30, 26  
 $9 - 1 = 8$        $10 - 6 = 4$        $26 - 15 = 11$
- (d) 210, 250, 260, 180, 240      (e) 6.2, 7.3, 8.8, 1.5, 4.1      (f) 3, 1, 2, 1, 3, 4, 5, 0, 1  
 $260 - 180 = 80$        $8.8 - 1.5 = 7.3$        $5 - 0 = 5$
- (g) -5, 1, 3, 6, -8, 1      (h) -6, -10, -2, -9      (i) 0, 7, 9, -21, 10, -4  
 $6 - (-8) = 14$        $-2 - (-10) = 8$        $10 - (-21) = 31$
- (j) 7, 9, -2, 13, 9, 8, 20, -8, 1      (k) -10, -6, -15, -9, -8, -7, 8, -3  
 $20 - (-8) = 28$        $8 - (-15) = 23$

## Mixed

Question 1: The length of nine caterpillars are listed below

9cm	4cm	8cm	10cm	7cm	5cm	13cm	10cm	6cm
4	5	6	7	8	9	10	10	13

- (a) Find the mode 10  
 (b) Find the median 8  
 (c) Find the mean 8  
 (d) Find the range 9



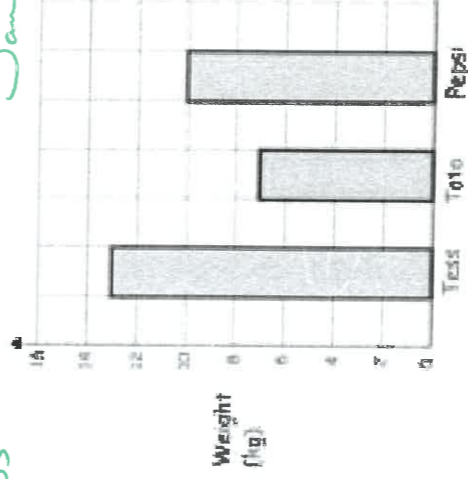
Question 2: James plays six games of darts.  
 His scores are 120, 71, 80, 14, 90, 117

14    71    80    90    117    120

Should James use the mean or the median to give him the highest average score?

↓ 82      ↓ 85

James should use the median as an average



Question 3: Shown are the weights of 3 puppies.

- (a) Work out range of the weights 6  
 (b) Work out the median weight 10  
 (c) Work out the mean weight 10

## 9. Angles

### Identifying Angles

Question 1: Write down if each angle below is acute, obtuse or reflex.

- (a) Acute      (b) Obtuse      (c) Obtuse      (d) Acute
- (e) Reflex      (f) Reflex      (g) Acute      (h) Obtuse
- (i) Reflex      (j) Acute      (k) Reflex      (l) Obtuse



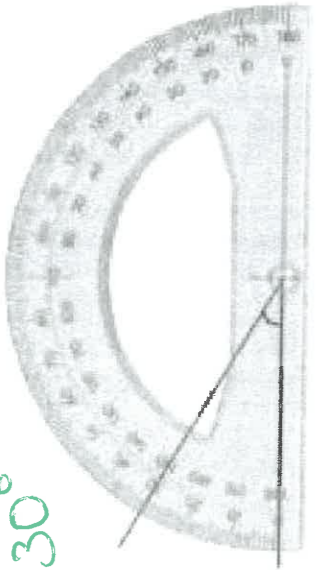
Types of Angle

## Measuring Angles

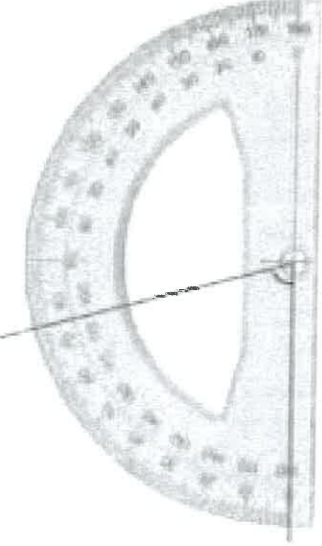


Question 1: Write down the size of each angle being measured

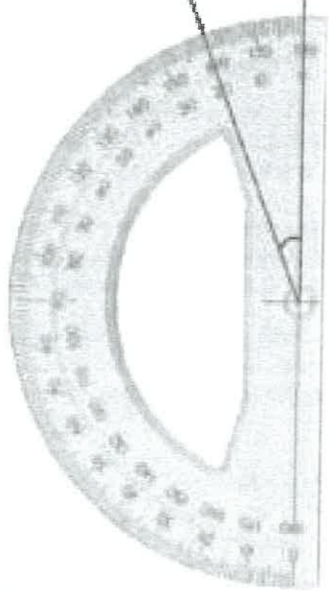
(a)  $30^\circ$



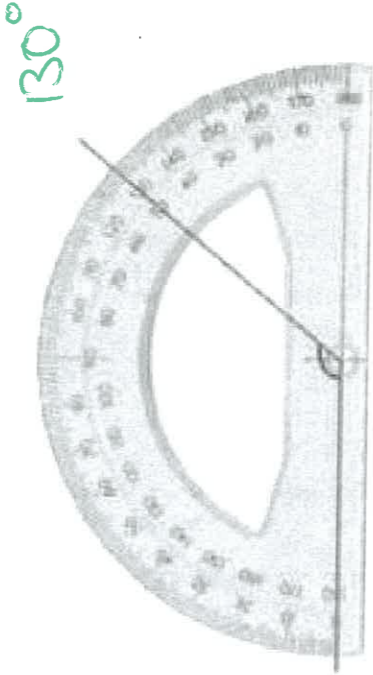
$75^\circ$



(c)



(d)

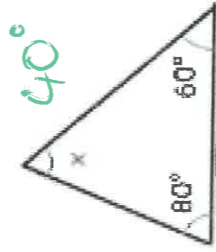


## Angles in a Triangle

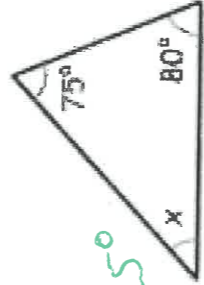


Question 1: Find the size of each missing angle.

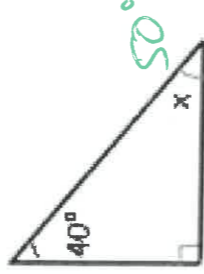
(a)  $40^\circ$



(b)

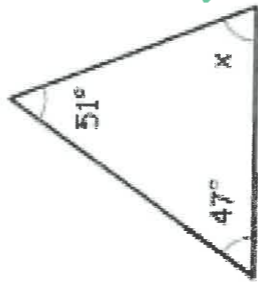


$25^\circ$

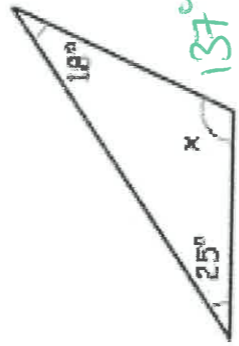


(c)

(d)  $51^\circ$ ,  $47^\circ$ ,  $x$ ,  $82^\circ$



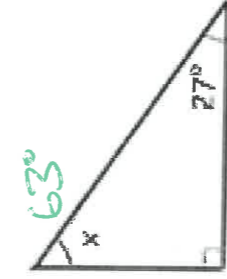
(e)



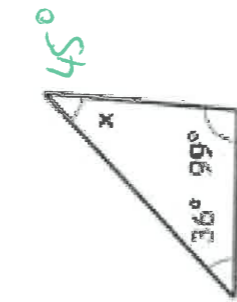
(f)

$39^\circ$

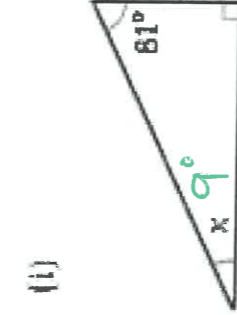
(g)  $63^\circ$



(h)

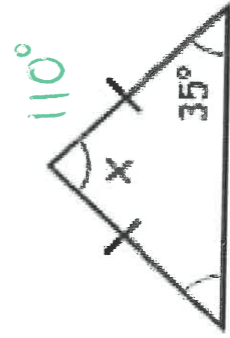


(i)

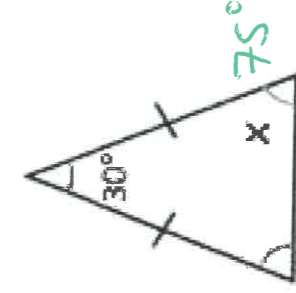


Question 2: Find the size of each missing angle.

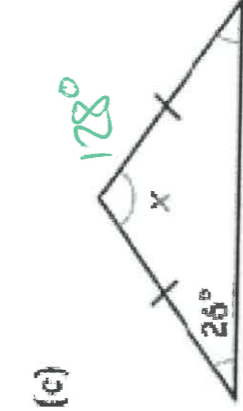
(a)  $110^\circ$



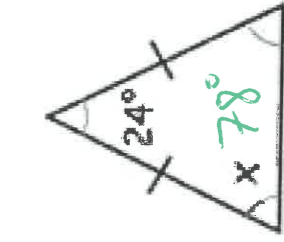
(b)



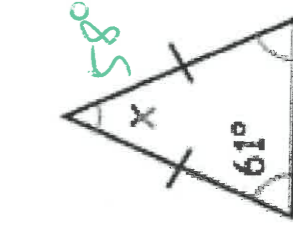
(c)



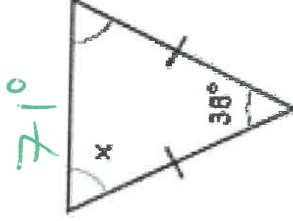
(d)

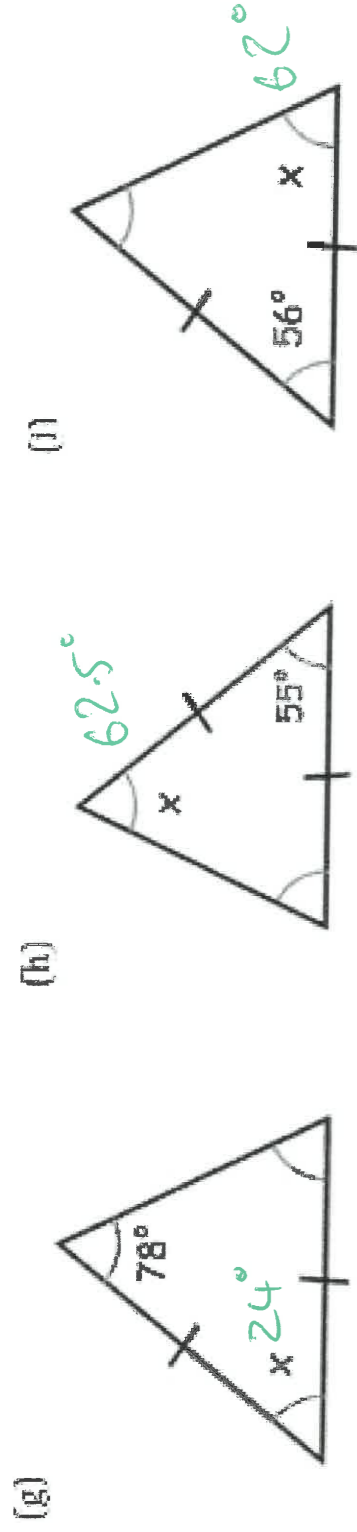


(e)

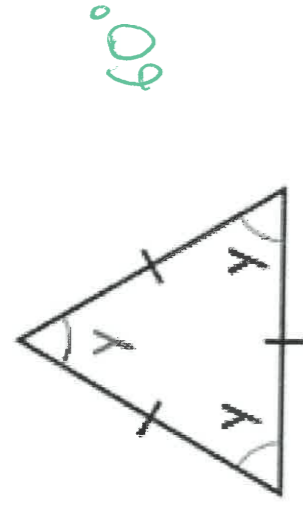


(f)

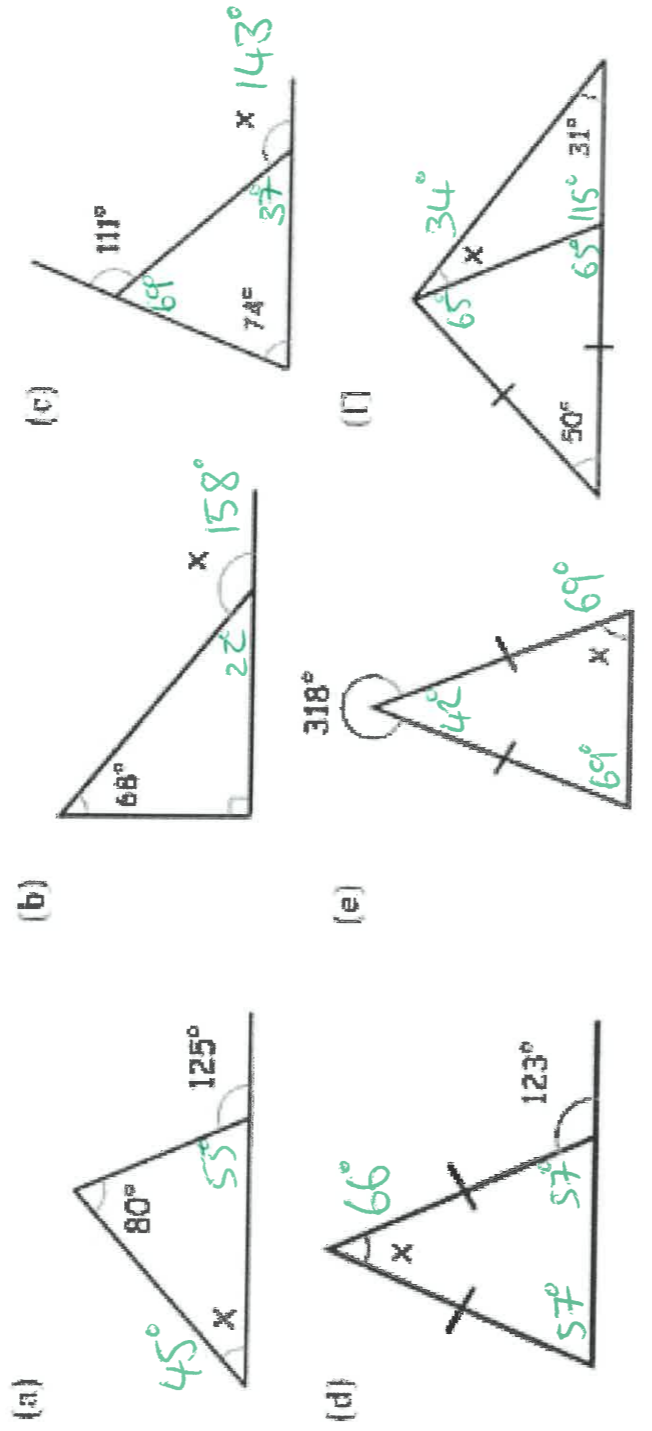




Question 3: Shown is an equilateral triangle. Find the size  $y$ .



Question 4: Find the size of each missing angle.



### 10. Algebra

Question 1: Expand the following brackets

- (a)  $5(y + 3)$   $5y + 15$
- (b)  $4(a + 2)$   $4a + 8$
- (c)  $8(w + 10)$   $8w + 80$
- (d)  $3(x - 7)$   $3x - 21$
- (e)  $9(s - 1)$   $9s - 9$
- (f)  $2(8 - t)$   $16 - 2t$
- (g)  $7(4 + h)$   $28 + 7h$
- (h)  $10(a + 2b + 3c)$   $10a + 20b + 30c$
- (i)  $4(3y + 2)$   $12y + 8$
- (j)  $5(2p - 1)$   $10p - 5$
- (k)  $3(7a + 2)$   $21a + 6$
- (l)  $9(2x - 5)$   $18x - 45$
- (m)  $5(4 + 3t)$   $20 + 15t$
- (n)  $7(9 - 2c)$   $63 - 14c$
- (o)  $8(3w + 1)$   $24w + 8$
- (p)  $9(1 - 4p)$   $9 - 36p$
- (q)  $11(2k - 5)$   $22k - 55$
- (r)  $20(6a + 5c)$   $120a + 100c$
- (s)  $3(15w - 7)$   $45w - 21$
- (t)  $3(9 - 2a)$   $27 - 6a$

Question 2: Expand the following brackets

- (a)  $-2(w + 5)$   $-2w - 10$
- (b)  $-3(c + 7)$   $-3c - 21$
- (c)  $-8(c + 7)$   $-8c - 56$
- (d)  $-10(y - 2)$   $-10y + 20$
- (e)  $-7(g - 3)$   $-7g + 21$
- (f)  $-4(2w + 3)$   $-8w - 12$
- (g)  $-9(3w - 5)$   $-27w + 45$
- (h)  $-9(5x - 1)$   $-45x + 9$
- (i)  $-5(6 - c)$   $-30 + 5c$
- (j)  $-6(4 + 3m)$   $-24 - 18m$
- (k)  $-2(1 + 9c)$   $-2 - 18c$
- (l)  $-5(8a - 7w)$   $-40a + 35w$



Breaking Brackets

Question 3: Expand the following brackets

- (a)  $a(c+2)$   $ac+2a$  (b)  $c(d-3)$   $cd-3c$  (c)  $a(b+c)$   $ab+ac$  (d)  $w(8-y)$   $8w-wy$   
 (e)  $c(5+a)$   $5c+ac$  (f)  $w(a-9)$   $aw-9w$  (g)  $y(s+t)$   $sy+ty$  (h)  $2a(c-3)$   $2ac-6a$   
 (j)  $5x(y+8)$   $5xy+40x$  (k)  $3a(2c+9)$   $6ac+27a$  (l)  $9k(2+d)$   $18k+9dk$   
 (m)  $5(2f+9w)$   $10f+45w$  (n)  $3y(5p+2)$   $15py+6y$  (o)  $2s(t+1)$   $2st+2s$   
 (p)  $-4a(8x-3)$   $-32ax+12a$

Question 4: Expand the following brackets

- (a)  $a(a+2)$   $a^2+2a$  (b)  $y(y-5)$   $y^2-5y$  (c)  $w(a+w)$   $aw+w^2$  (d)  $c(9-c)$   $9c-c^2$   
 (e)  $p(2p+5)$   $2p^2+5p$  (f)  $2w(3w-1)$   $6w^2-2w$  (g)  $9y(2y+3)$   $18y^2+27y$  (h)  $4c(2a+5c)$   $8ac+20c^2$

Question 5: Expand and simplify

- (a)  $5(y+3)+2(y+7)$   $=5y+15+2y+14 = 7y+29$  (b)  $6(2w+5)+9(w+2)$   $=12w+30+9w+18 = 21w+48$   
 (d)  $7(2g+3)-5(g+2)$   $=14g+21-5g-10 = 9g+11$  (e)  $6(x-2)-4(x-8)$   $=6x-12-4x+32 = 2x+20$   
 (g)  $8(5+2m)+3(5-3m)$   $=40+16m+15-9m = 55+7m$  (h)  $4(w+7)-2(2w+1)$   $=4w+28-4w-2 = 26$   
 (c)  $3(y-2)+4(2y+5)$   $=3y-6+8y+20 = 11y+14$   
 (f)  $2(3y-8)-5(2y-1)$   $=6y-16-10y+5 = -4y-11$   
 (i)  $9(1+2y)+3(3-y)$   $=9+18y+9-3y = 15y+18$

Question 1: Expand and simplify

- (a)  $(w+4)(w+2)$   $=w^2+6w+8$  (b)  $(y+1)(y+2)$   $=y^2+3y+2$  (c)  $(c+2)(c+5)$   $=c^2+7c+10$  (d)  $(x+6)(x+7)$   $=x^2+13x+42$   
 (e)  $(a+5)(a-3)$   $=a^2+2a-15$  (f)  $(g+7)(g-4)$   $=g^2+3g-28$  (g)  $(s-4)(s+5)$   $=s^2+s-20$  (h)  $(x+1)(x-3)$   $=x^2-2x-3$   
 (i)  $(p-3)(p-2)$   $=p^2-5p+6$  (j)  $(y-4)(y-4)$   $=y^2-8y+16$  (k)  $(k-5)(k-6)$   $=k^2-11k+30$  (l)  $(v+4)(v+3)$   $=v^2+7v+12$   
 (m)  $(n+8)(n-10)$   $=n^2-2n-80$  (n)  $(b-3)(b+7)$   $=b^2+7b-21$  (o)  $(z-9)(z-3)$   $=z^2-12z+27$  (p)  $(a-5)(a+7)$   $=a^2+2a-35$   
 (q)  $(w+2)(w-8)$   $=w^2-6w-16$  (r)  $(r+7)(r+7)$   $=r^2+14r+49$  (s)  $(w-11)(w+1)$   $=w^2-10w-11$  (t)  $(t-8)(t-7)$   $=t^2-15t+56$



Breaking  
Double  
Brackets

Question 1: Factorise the following expressions

- (a)  $4x+6$   $2(2x+3)$  (b)  $15x+20$   $5(3x+4)$  (c)  $9y-12$   $3(3y-4)$  (d)  $5x+15$   $5(x+3)$   
 (e)  $6x-3$   $3(2x-1)$  (f)  $4x+8$   $4(x+2)$  (g)  $5y-25$   $5(y-5)$  (h)  $8w+24$   $8(w+3)$   
 (i)  $10y+15$   $5(2y+3)$  (j)  $14w+21$   $7(2w+3)$  (k)  $20y-30$   $10(2y-3)$  (l)  $27x+18$   $9(3x+2)$   
 (m)  $6-4x$   $2(3-2x)$  (n)  $9+12y$   $3(3+4y)$  (o)  $45+60x$   $15(3+4x)$  (p)  $16y-32$   $16(y-2)$   
 (q)  $22a+55$   $11(2a+5)$  (r)  $100-40y$   $20(5-2y)$  (s)  $6x+9y$   $3(2x+3y)$  (t)  $4w-2a$   $2(2w-a)$   
 (u)  $25y-35z$   $5(5y-7z)$  (v)  $8x^2+20$   $4(x^2+5)$  (w)  $30y^3-15$   $15(2y^3-1)$  (x)  $42y+28x-56c$   $14(3y+2x-4c)$



Factorising



Question 2: Factorise the following expressions

(a)  $x^2 + 7x$   
 $x(x+7)$

(e)  $x^2 - 7x$   
 $x(x-7)$

(j)  $10c + c^2$   
 $c(10+c)$

(m)  $12x^2 + 18x$   
 $6x(2x+3)$

(b)  $x^2 - 3x$   
 $x(x-3)$

(f)  $4w^2 + 10w$   
 $2w(2w+5)$

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

(n)  $24x^2 - 18x$   
 $6x(4x-3)$

(c)  $y^2 + y$   
 $y(y+1)$

(g)  $6x^2 - 8x$   
 $2x(3x-4)$

(k)  $14x^2 + 35x$   
 $7x(2x+5)$

(o)  $45y^2 + 60y$   
 $15y(3y+4)$

(d)  $w^2 + 9w$   
 $w(w+9)$

(h)  $9y^2 - 6y$   
 $3y(3y-2)$

(l)  $40x^2 - 50x$   
 $10x(4x-5)$

(p)  $7w^2 + 2w$   
 $w(7w+2)$

Question 3: Factorise the following expressions

(a)  $x^2 + xy$   
 $x(x+y)$

(e)  $6c^2 - 4cd$   
 $2c(3c-2d)$

(i)  $8cdf + 10cde$   
 $2cd(4f+5e)$

(m)  $6mn - 7m^2n$   
 $m(6-7m)$

(b)  $a^2 - ab$   
 $a(a-b)$

(f)  $10x^2 + 15xy$   
 $5x(2x+3y)$

(j)  $7w^2 + 6w + wy$   
 $w(7w+6+y)$

(n)  $11g^2h + 22h^2$   
 $11h(g^2+2h)$

(c)  $xy + xz$   
 $x(y+z)$

(g)  $12ab + 18bc$   
 $6b(2a+3c)$

(k)  $8ab^2 - 10ab$   
 $2ab(4b-5)$

(d)  $ab + ac - ad$   
 $a(b+c-d)$

(h)  $8xy + 4y^2$   
 $4y(2x+y)$

(l)  $4xy^2 + 6xy + 2x^2y$   
 $2xy(2y+3+2x)$