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The C/D Borderline www.m4ths.com Challenge
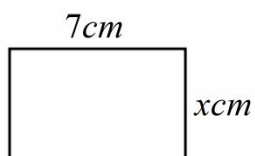
Round 1 (Non Calculator)

(1) Solve the equation $2x - 1 = 5$
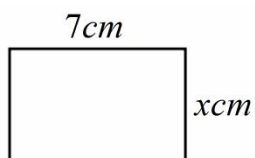
(2) Find the value of $4 + 3 \times 2$

(3) Write down the value of 2^4

(4) Given the area of the rectangle below is $42cm^2$ find the value of x

```
     7cm
   ┌──────┐
   │      │ xcm
   └──────┘
```

(5) Using the value of x found in question 4, find the perimeter of the rectangle

```
     7cm
   ┌──────┐
   │      │ xcm
   └──────┘
```

(6) Expand $3x(2x - 1)$

(7) Find the median of the following numbers: $2,3,7,5,3,9,10$

(8) Find the value of $\dfrac{1}{3} + \dfrac{2}{5}$

(9) Find the value of 0.2×0.3

(10) John is n years old. Sue is 3 years younger than twice his age. Write an expression for Sue's age in terms of n.
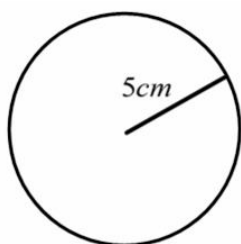
Round 2 (Non Calculator)

(1) Find the lowest common multiple (LCM) of 6 and 8

(2) Round 9.8368 to two significant figures.

(3) 8 pens cost £1.20. How much does it cost for 5 pens?

(4) Find the area of the circle below with a radius of $5cm$

(5) Simplify $2x + 4y - 3x + y$

(6) Trevor and Kevin share £60 in a ratio $5:7$. How much more does Kevin get than Trevor?

(7) Find the value of $\dfrac{4}{5} - \dfrac{7}{10}$

(8) Find the value of $-11 - (-2)$

(9) Write down the mode of the following numbers $4, 2, 11, 13, 9, 7, 5, 6$

(10) The probability Smallville town win a game of football is 0.2. The probability they draw is 0.36. What is the probability they lose?
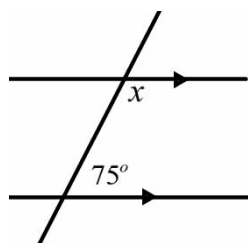
Round 3 (Non Calculator)

(1) Write $\frac{1}{3}$ as a decimal.

(2) Find the highest common factor of 10 and 15.

(3) Find the area of a triangle with a base of $5cm$ and a height of $10cm$

(4) Write 2% as a decimal.

(5) State the size of angle x.

(6) Tyler score 7 out of 20 in his maths test. What % did he get?

(7) Solve the equation $\frac{y}{4} - 3 = -1$

(8) On Saturday the temperature in Moscow was $-14^{o}C$. On the same day in London it was $-3^{o}C$. Which city was warmer and by how much?
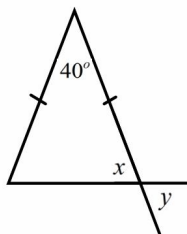
(9) Write down the reciprocal of 5

(10) Find the range of the following numbers 6, 3, 12, 24, 7, 9, 31, 16
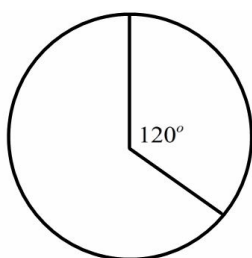
Round 4 (Non Calculator)

(1) Increase £30 by 12%

(2) Find the size of angle x and angle y

(3) Simplify $p \times p \times p \times p$

(4) The pie chart below shows information from a survey about whether people liked pizza or not. More than half of the people said they liked pizza and less than half of the people surveyed said they didn't. There were 48 people in the survey. How many didn't like pizza?
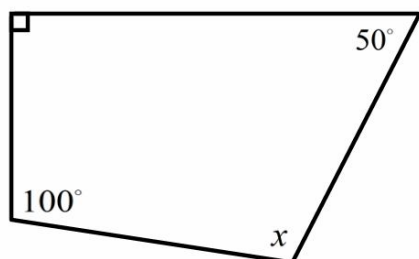

(5) Circle the square numbers from the list below:
1, 2, 9, 16, 17, 21

(6) Round 4.732 to 2 decimal places.

(7) Find the size of angle x below

(8) Write $\dfrac{5}{8}$ as a decimal

(9) Steve walked at 3mph for 3hrs and 30 minutes. How far did he walk?

(10) A shape has been translated by the vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$.
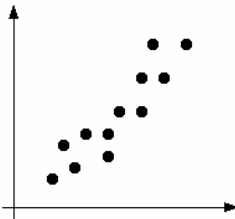
State fully what has happened to the shape.

Round 5 (Non Calculator)

(1) Simplify the ratio $6:4:12$

(2) The exchange rate for pounds (£) to dollars ($) is £1 = $1.6.
John exchanges $48 into pounds. How much many pounds does he get?

(3) State the type of correlation shown in the graph below

(4) There were 90 pupils in Year 11 at Smallville High School. Some information about the pupils is shown below. Complete the two way table.

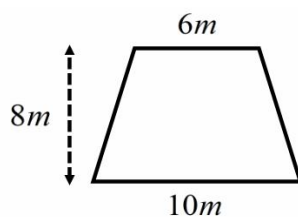|	Right Handed	Left Handed	Total
Boys		30	
Girls	15		
Total	55		

(5) 20% of the boys in year 11 at Park High School have black hair. There are 14 boys in year 11 have black hair. How many boys in year 11 at Park High School have black hair?

(6) Given $104 \times 27 = 2808$ state the value of 1.04×2.7

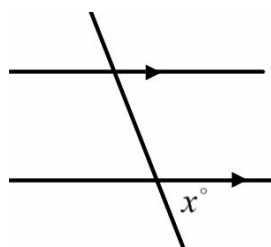(7) Write down the value of $-14 \div -7$

(8) (i) Name the shape below
    (ii) Find the area of the shape below

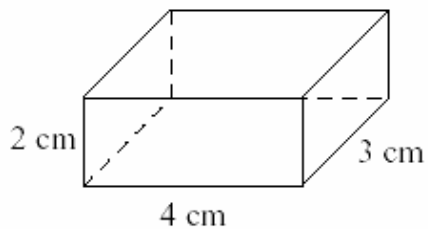(9) In the diagram below angle x is an acute angle.
Label all of the other angles with a value of x on the diagram.

(10) List the factors of 24

Round 6 (Non Calculator)

(1) Draw 1 possible net of the open topped box below.

2 cm   3 cm   4 cm

(2) Paula can either win or lose when she plays a tennis match. She is 3 times more likely to win a match than she is to lose. Write down the probability of her losing a match.
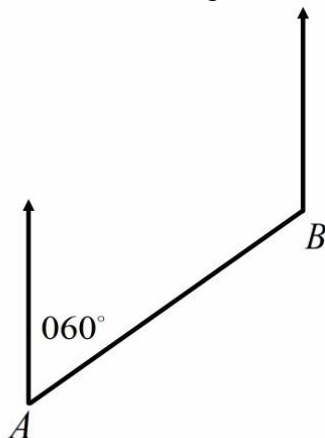
(3) Kevin says the midpoint of the line from $A(3,2)$ to $B(7,6)$ is $(5,8)$. Is Kevin right?

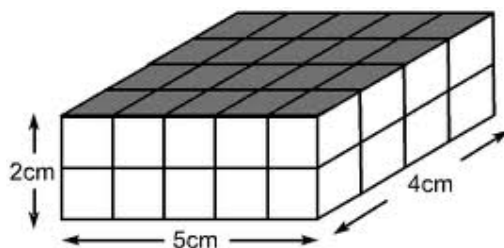(4) Write down the first 6 prime numbers.

(5) Write down the next two numbers in the sequence: 32, 16, 8, 4, 2, ____, ____,

(6) Factorise $10x - 15$

(7) Find the Bearing of A from B.

$060°$

A

B

(8) Find the volume of the solid below

2cm   4cm

5cm

(9) Find the median of the following numbers: 9, 2, 7, 3, 5, 6, 11

(10) Given $p = 2$ and $q = 3$ find the value of $2p^2 - q$

(1) Find the cube of 4.

(2) 3 of the fractions below have the same value. Circle the one that doesn't

$$\frac{2}{6}, \frac{2}{5}, \frac{3}{9}, \frac{7}{21}$$

(3) Find the difference between 30% of £40 and $\frac{2}{5}$ of £40.

(4) Simplify $-2p + 4 + q + 3p - q$

(5) Taking $\pi = 3$ find the circumference of circle with a radius of 4cm.

(6) Draw an obtuse angle and estimate its size.

(7) Make a the subject of the equation $v = u + at$

(8) Sue pays £4.84 for two boxes of cereal. Each box of cereal was the same price. How much change would she get from £5 if she bought 1 box of cereal.

(9) Solve the equation $2(x - 1) = 4$
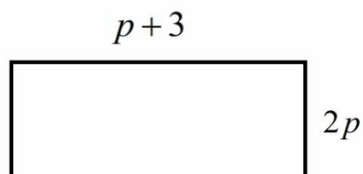
(10) Write 0.23 as a percentage.

Round 8 (Non Calculator)

(1) John thinks of 2 different numbers. They have a sum of 12 and a difference of 2. What are the two numbers?

(2) Work out the value of $6 \div 3 + 2$

(3) It takes 3 men 6 days to build a wall. How long would it take 2 men to build the same wall if they worked at the same speed?

(4) Write down an expression for the area of the rectangle below

$p + 3$

$2p$

(5) Find the value of $\dfrac{1}{3} \div \dfrac{2}{7}$ giving your answer as a mixed number.

(6) The bar chart below shows the number of gold stars 4 students got in class 7C1. Find the mean score for the 4 students.
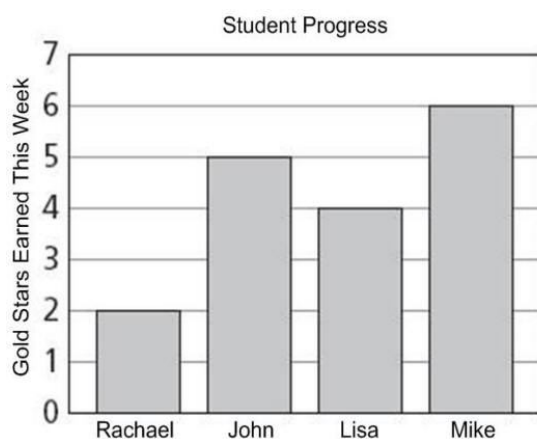
(7) John travels 30 miles in 3 hours. Find his average speed.

(8) An isosceles triangle has one angle of $x°$ and two angles of $y°$. Given $x = 40$ find the value of y.
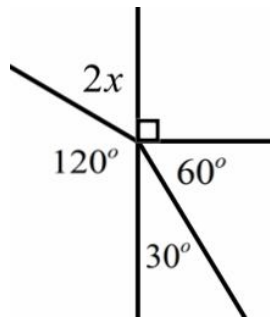
(9) State the order of rotational symmetry of the shape below

(10) Solve the equation $1 - 2p = -5$

Round 9 (Non Calculator)

(1) Find the value of x

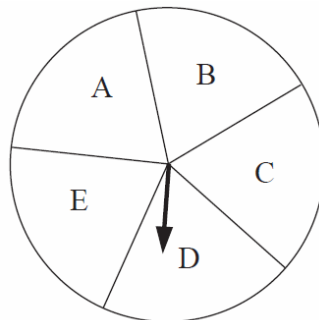(2) Write down the next two numbers in the sequence below and state the rule for the sequence:

$$1, \ 4, \ 9, \ 16,$$

(3) Find the value of $-6+(-9)$

(4) Put these numbers in order of size, smallest first:

$$\frac{1}{2}, \ 0.24, \ \frac{3}{10}, \ 25.5\%, \ \frac{1}{3}$$

(5) Jane has fair spinner with the letters A, B, C, D and E on. What is the probability the spinner lands on a vowel if she spins it once?


(6) State the value of the 4 in the number 74356

(7) The probability of it snowing on any given day in Sunnyville is 0.2
John is going on holiday to Sunnyville for 20 days. How many days would you expect it to snow for?

(8) State and imperial measure that could be used to weigh an adult human.

(9) Find an estimate to the calculation 9.82×4.31
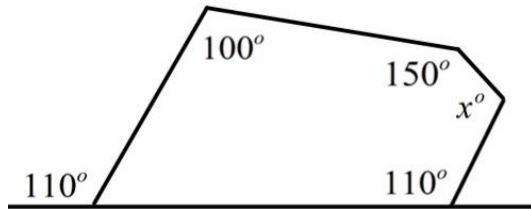You must show your workings

(10) Write down the value shown by the arrow below
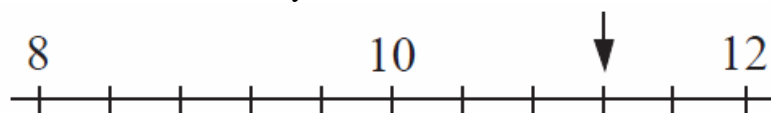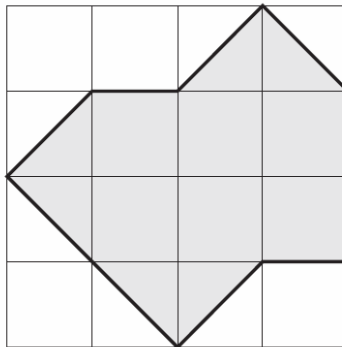
Round 10 (Non Calculator)

(1) Find the value of 27×321

(2) Find the size of x^o

(3) Peter is thinking about 3 different numbers. The highest common factor of the 3 numbers is 2. Write down 3 possible numbers he is thinking about.
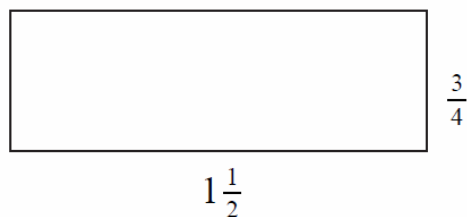
(4) Find the area of the shape below

(5) Factorise $2x - 8$

(6) Round 43.75 to 2 significant figures.

(7) Find the difference between the size of the length and the width of the rectangle below:

$$\frac{3}{4}$$

$$1\frac{1}{2}$$

(8) Write down the mode of the numbers below:

6, 2, 3, 11, 32, 2, 5, 11, 7, 2

(9) Decrease £8 by 11%

(10) Write 33.5% as a decimal.

Round 11 (Calculator Allowed)

(1) The lowest common multiple of two single digit numbers is 10. What are the two numbers?

(2) Use your calculator to find $\sqrt{\dfrac{24.32}{3 \times 0.17}}$. Round your answer to 1 decimal place.

(3) Jill is collecting information about the use of her local swimming pool and is making a questionnaire. Write a suitable question for her questionnaire.

(4) Fred lives 10 minutes from Pigeon Rock. He needs to be at Rourke's Park for 4pm. What is the latest he can leave home to ensure he gets to Rourke's Park on time?

Service 405

Tuesday - Sunday (does not operate on Mondays)

Trassey Road, Moyad Road Junction^c	0947	1117	1417	1547	1717
Fofanny Dam	0949	1119	1419	1549	1719
Ott Mountain, for Spelga Dam ^{d}	0950	1120	1420	1550	1720
Pigeon Rock	0955	1125	1425	1555	1725
Slievenagore, for Lough Shannagh Path	0959	1129	1429	1559	1729
Attical Village, Bus Shelter	1002	1132	1432	1602	1732
Silent Valley, Entrance	1006	1136	1436	1606	1736
Carrick Little	1011	1141	1441	1611	1741
Rourke's Park	1015	1145	1445	1615	1745

(5) Complete the table of values below for $y = x^2 + 2x$ for $-2 \le x \le 2$

x	-2	-1	0	1	2
y			0	3	

(6) Find the area of the triangle below. Give your answer to 1 decimal place:

4.26cm

3.12cm
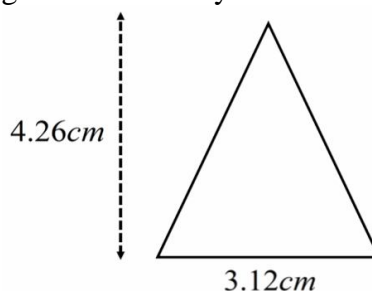
(7) Expand $3(2p - 3)$

(8) Sarah buys 8 packets of biscuits priced at £1.27 each. Find out how much change she gets if she pays with a £20 note?

(9) Draw an ordered stem and leaf diagram for the following data clearly indicating the key that you use.

3, 21, 34, 21, 17, 7, 24, 37, 34, 35, 23, 14

(10) Study the word below

MATHEMATICIAN

Terry picks a letter at random from the word. What is the probability he picks the letter I?

Round 12 (Calculator Allowed)

(1) Paul owes a company £3056.16. He agrees to pay the debt off monthly for 2 years. Work out his monthly repayments if he pays the same amount each month.
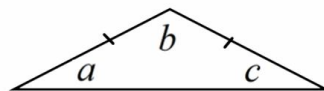
(2) Solve the equation $3x - 1 = 17.4$ giving your answer to one decimal place.

(3) The diagram below shows 3 circles that share the same tangent.
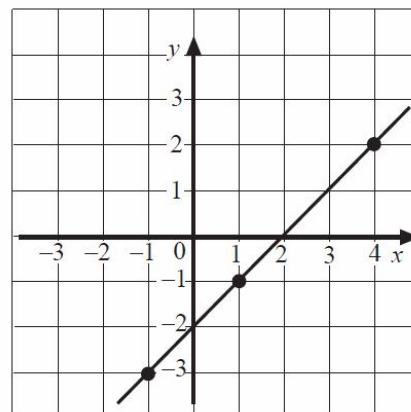Write down the equation of the tangent.
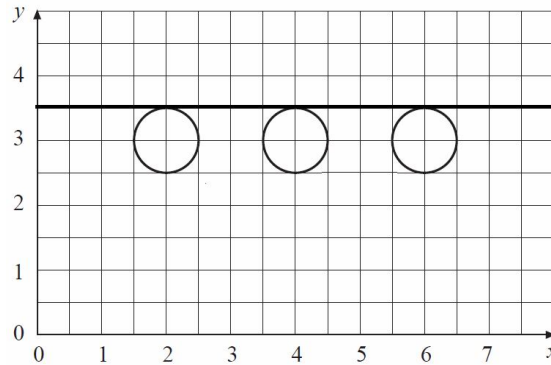
(4) $\dfrac{9}{10}$ of the boys at a local rugby club also play football. There are 30 boys at the club. How many don't play football?

(5) Angle b is at least 100°. Find the maximum size angle c can be.

(6) From the graph below state the value of x when $y = 1$

(7) Find the sum of the first 2 cube numbers.

(8) State 3 integers that satisfy the inequality $x < -3$

(9) Round the number 514 to 2 significant figures.

(10) A shop is open from 9am until 4pm 6 days a week. How many hours in total is it open each week?

Round 13 (Calculator Allowed)

(1) Bob is measuring the height of plants. He measures one plant to be 664mm. Circle the class the plant should be placed in on the frequency table below.

Height (cm)	$50 < h \leq 55$	$55 < h \leq 60$	$60 < h \leq 65$	$65 < h \leq 70$	$70 < h \leq 75$	$75 < h \leq 80$	$80 < h \leq 85$
Frequency	100	300	2400	1300	700	150	50

(2) Using the table in question 1 (shown below) state the modal class from the frequency table.

Height (cm)	$50 < h \leq 55$	$55 < h \leq 60$	$60 < h \leq 65$	$65 < h \leq 70$	$70 < h \leq 75$	$75 < h \leq 80$	$80 < h \leq 85$
Frequency	100	300	2400	1300	700	150	50

(3) Paula scores 37 out of 46 in a test. Calculate the percentage she scores giving your answer to the nearest whole number.

(4) List the factor of 12 and state which ones are prime numbers.

(5) Find the value of $(2 + b)^2$ when $b = -3$.

(6) The perimeter of the shape below is 26 cm. Find the value of x

6 cm
x cm
5 cm
3 cm
x cm
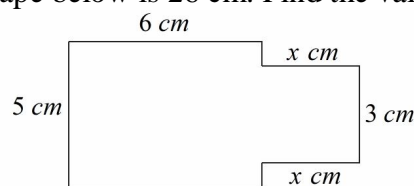
(7) Jaffa Biscuits cost £1.80 for 8. Find to the nearest penny how much one Jaffa Biscuit costs.

(8) Kelly drives from Town A to Town B with an average speed of 30mph. The journey takes her 1 hour 15 minutes to get from Town A to Town B. What is the distance between the two towns?
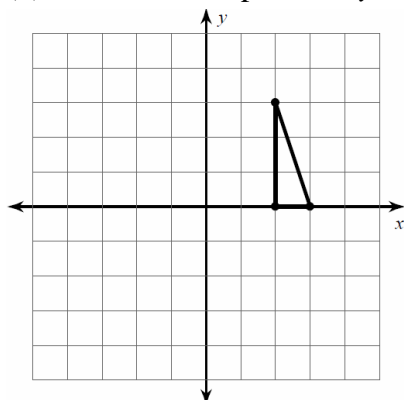
(9) Translate shape A by the vector $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$
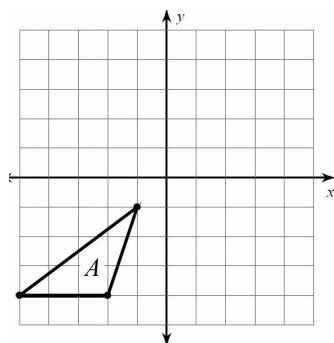
(10) Simplify $2p \times 3q$

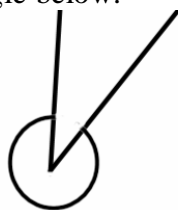## Round 14 (Calculator Allowed)

(1) Reflect the shape in the *y* axis

(2) From the list of numbers below pick the one number that is both a cube number and a multiple of 4.
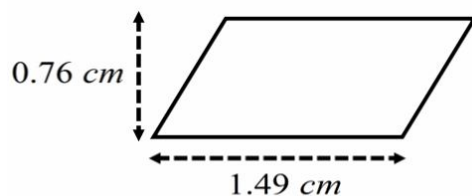
$$3, \ 9, \ 4, \ 16, \ 8, \ 28, \ 100, \ 27, \ 1$$

(3) State the value of the 9 in the number 33.491

(4) Estimate the size of the reflex angle below.

(5) Name the shape below and find its area:

0.76 *cm*

1.49 *cm*

(6) The range of a set of numbers is 22. Given the highest number in the set is 27 write down the value of the lowest number in the set.

(7) Trevor uses the formula $P = 10 + 1.8W$ to charge his customers for cleaning their windows. P is the price and W is the number of windows they have cleaned. Find out the cost of having 9 windows cleaned.

(8) Use your calculator to find $1.02^3 \times \sqrt{24.3}$ and round your answer to 2 decimal places.
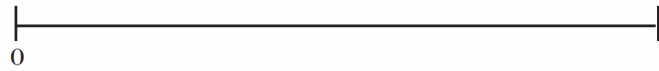
(9) Expand $x(x-3)$

(10) Find the lowest common multiple of 12 and 20.

Round 15 (Calculator Allowed)

(1) Solve the equation $2(x-3)=5$

(2) Place the following events on the probability line below:

(A) Rolling a number 5 on a fair six sided dice
(B) Flipping a head on a fair coin
(C) Picking a day of the week beginning with the letter M

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├──────────────────────────────────┤
0                                    1
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(3) There are 65 girls in year 11 at Smallville High School. Simone says exactly $\frac{1}{4}$ of the girls in year 11 have black hair. Explain why she is wrong.

(4) The probability of Fred winning a game of chess is 0.23. He plays 72 games one year. How many of the 72 games would you expect him to win?

(5) Write down a number that is a multiple of 8 **and** a square number.

(6) Insert **one** set of brackets to make the following calculation true: $2+3\times4=20$

(7) Circle the largest integer in the list below:

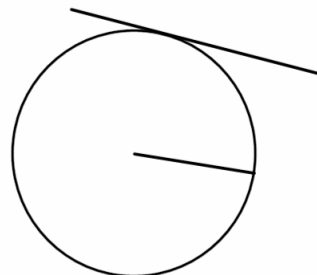$$2, \quad 4.8, \quad \frac{17}{4}, \quad 1.98, \quad 3, \quad 6.3$$

(8) Kate works for 7 and a half hours at £9.87 an hour. Find out how much she earns.

(9) Calculate the mean of the following numbers: 1.23, 2.71, 4.89, 0.84

(10) Draw an arrow from the words below to label the circle parts in the diagram
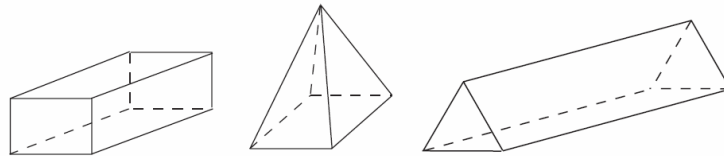
Radius   Tangent   Circumference

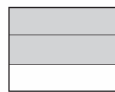## Round16 (Calculator Allowed)

(1) Draw an arrow to match the shape with its correct name from the list below.

TRIANGULAR PRISM   CUBOID   CONE   PYRAMID   CUBE

(2) Fill out the numerator of the fraction below to complete the sentence:
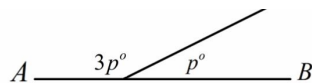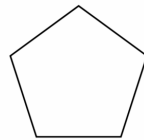
"Exactly $\dfrac{\ }{6}$ of the shape is shaded"

(3) Mike is given a sequence of numbers. The rules is "Divide by 3 each time"
Find the next two numbers in the sequence:

$$81,\ 27,\ 9,\ 3,\ 1,\ \ ,$$

(4) The straight line AB is shown below. Find the value of p .

$A \underline{\quad \overset{3p^o}{\qquad} \overset{p^o}{\qquad\quad}} B$

(5) The perimeter of the regular pentagon shown below is 32.88cm. Find the length of each side giving your answer to 2 significant figures.

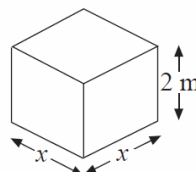(6) 16 pencils cost £6.08. Find the cost of 15.

(7) The pictogram below shows the favourite sports of people in year 11 at a school.
28 pupils picked either cricket or tennis. How many pupils picked snooker?

Football
Tennis
Swimming
Cricket
Snooker
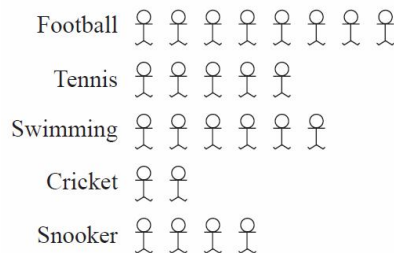
(8) Simplify $-3y + 4x - 2x - y$

(9) Write 0.07 as a percentage.

(10) Write down an expression for the volume of the shape below.
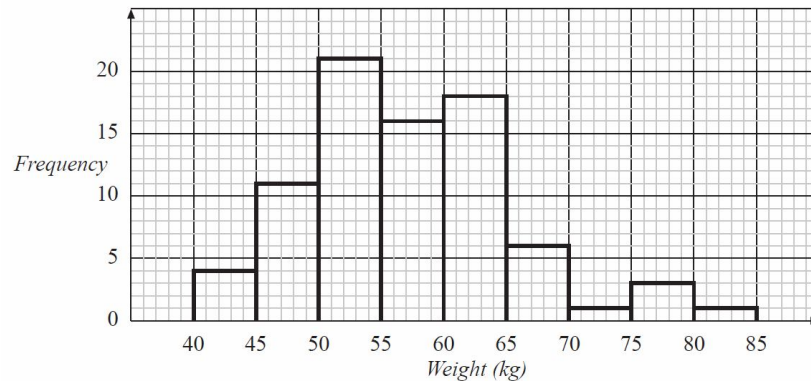
2 m

x x

Round 17 (Calculator Allowed)

(1) Using the formula $P = 4 - Q^2$ find the value of P when $Q = 0.03$
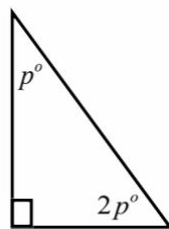Write down the full calculator display.

(2) A recipe to make 12 cakes requires 280g of flour. How much flour is required to make 30 cakes?

(3) The histogram below shows information about the weights of boxes in a warehouse. How many boxes weighed 70kg or more?

(4) Round 34.98 to 1decimal place.

(5) Find the size of each angle in the right angled triangle below.

(6) Share £14 in the ratio 10:17:1

(7) Draw the lines of symmetry on each of the following letters.

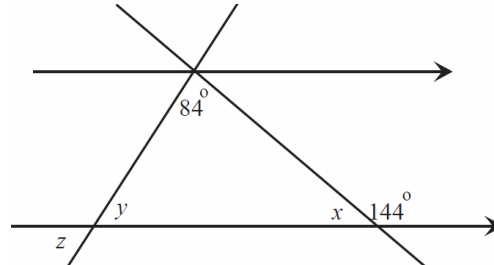(8) Write down the difference between the values of A and B.

(9) Increase 1.98 by 63%. Give your answer to 2 significant figures.

(10) Draw a rectangle with an area of $12cm^2$

Round 18 (Calculator Allowed)

(1) Find the circumference of a circle with a radius of 6cm. Round your answer to 2 decimal places.

(2) Find the size of angles x, y and z.

(3) Write down the mode from the stem and leaf diagram below.

```
 4 | 1 3 9
 5 | 2 7
 6 | 7 8 9
 7 | 0 2 3 3 3 3 3 4 4 5 6 7
 8 | 1 2 2
 9 | 2 6
10 | 1 8
11 | 2 4          4 | 3   represents 43
12 | 3
```

(4) Write down a metric measure for the volume of lemonade in a small glass.
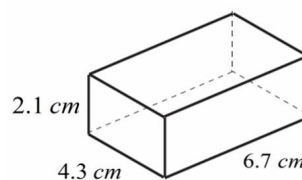

(5) Michael was £43 overdrawn in his bank account. He made a deposit at the bank. His balance is now in credit by £25. How much was the deposit he put in?

(6) Factorise $6p - 8$

(7) Decrease 38.13 by 17%. Round your answer to 1 decimal place.

(8) Find the volume of shape below giving your answer to 2 significant figures.

2.1 cm
4.3 cm
6.7 cm

(9) Circle the number in list below that is a multiple of 3, a square number and divisible by 4.
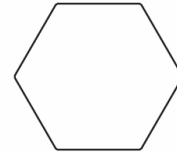
27, 9, 16, 36, 100, 24, 42

(10) Draw a shape that has **exactly** 2 lines of symmetry.
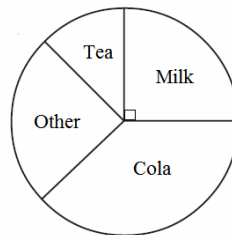
Round 19 (Calculator Allowed)

(1) Draw an arrow to match the shapes with their correct name.
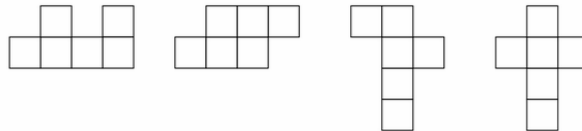
KITE   PARALLELOGRAM   RHOMBUS   HEXAGON   TRAPEZIUM

(2) Solve the equation $2(x-3)=4$

(3) In a survey at school Fred asked people what their favourite drink was. The pie chart shows the results below. 34 people chose milk. How many people did Fred ask?

(4) Find $\dfrac{5}{8}$ of £48

(5) Circle the nets below that will fold to make a cube.

(6) 1kg is approximately 2.2lbs. A baby weighs 7.4lbs. Find the baby's weight in kg. Give your answer to 1 decimal place.

(7) Sarah walks 13 miles at an average speed of 3.25mph. She started walking at 12:15pm and completed the 13 miles without stopping. What time did she finish her walk?
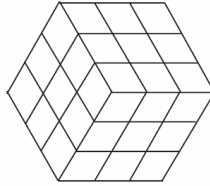
(8) Write down four different numbers that sum to 15.

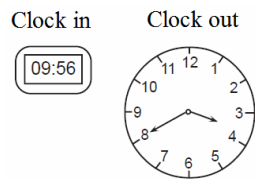(9) Translate the shape by the vector $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$
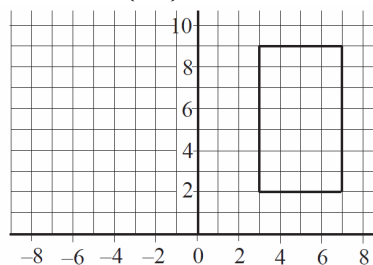
(10) Draw an obtuse angle less than 150° in size.

Round 20 (Calculator Allowed)

(1) Calculate the surface area of the cube below.

(2) Michael starts his shift at work in the morning and finishes in the afternoon. He sees the two clocks below in the factory where he works. How long was his shift?
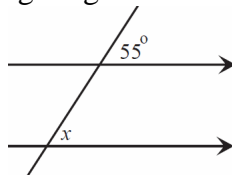
Clock in   Clock out

09:56

(3) Find the range of the data set below

```
 4 | 1 3 9
 5 | 2 7
 6 | 7 8 9
 7 | 0 2 3 3 3 3 3 4 4 5 6 7
 8 | 1 2 2
 9 | 2 6
10 | 1 8
11 | 2 4         4 | 3   represents 43
12 | 3
```
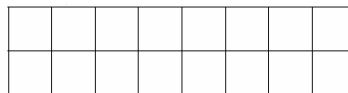
(4) Write down the factors of 36 that are square numbers.
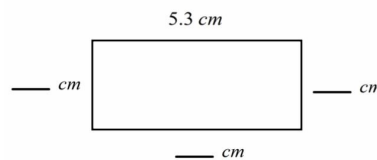
(5) Write down the size of angle x giving a reason for your answer.

$55°$

x

(6) Shade $\dfrac{1}{32}$ of the shape below.

(7) The perimeter of the rectangle below is 18.6cm. Find the lengths of the missing measurements.

5.3 cm

___ cm   ___ cm

___ cm
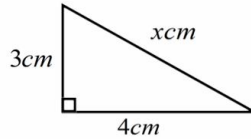
(8) Write down the value of the number 3 in 473,276.

(9) Simplify $2p \times 6p$

(10) Sandra thinks there are 12400 minutes in a week. Show she is wrong.

Round 21 (Non Calculator)
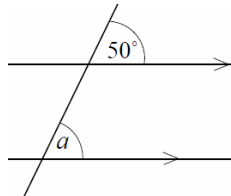
(1) If $p = -3$ what is the value of p^2?

(2) Find the value of x.

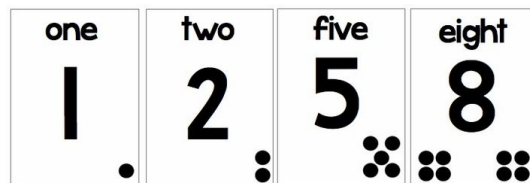(3) Write the ratio $3:7$ in the form $n:1$

(4) Solve the equation $2x + 1 = x + 5$

(5) State the value of a giving a reason for your answer.

(6) Increase £26 by 11%

(7) Paul has the 4 number cards below. Show Paul can split the cards into 2 pairs to make 2 square numbers.

(8) Estimate the answer of the follow calculation:
$$9.84 \times 21.27$$

(9) The picture below shows a regular hexagon with an exterior angle of 120°
Find the **sum** of the interior angles of the hexagon.
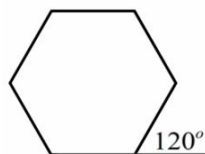
(10) Sylvia wants to find the area of the parallelogram below. Write down the calculation should she carry out to find the area of the parallelogram out in terms of a, b & c.

Round 22 (Non Calculator)

(1) Expand $a(a+b)$

(2) Find the value of $1-p^2$ when $p=-3$

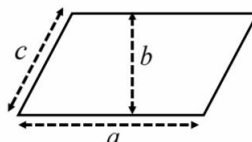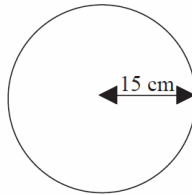(3) Bob and Sue share some money in the ratio 3:2. Sue has £18. How much does Bob have?

(4) Taking to $\pi = 3$ find the circumference of the circle below.

(5) Write 0.46 as a fraction in its simplest form.

(6) Write down the name of the shape the net below makes.
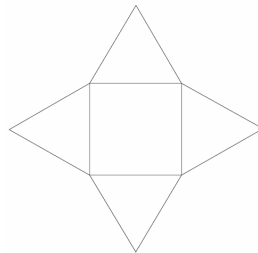
(7) Put these fractions in order of size starting with the smallest. You must show how you decided.

$$\frac{2}{3}, \; \frac{5}{6}, \; \frac{1}{2}$$

(8) Fred the gardener plants batches of seeds. He says 25% of the seeds he plants grow into flowers. One batch of seeds he planted produced 14 flowers. How many seeds did he plant in the batch?

(9) Write down the coordinates of A, B and C.
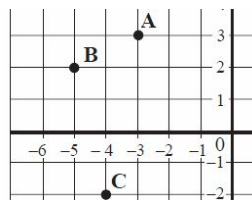
(10) Study the pattern below. How many dots would there be in the 30th picture in the pattern.

Round 23 (Non Calculator)

(1) Find the value of $-2 \div -4$

(2) What percentage of the shape shown below is NOT shaded?
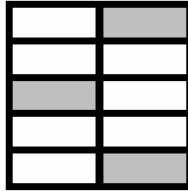
(3) Make an accurate drawing of the cuboid shown below.
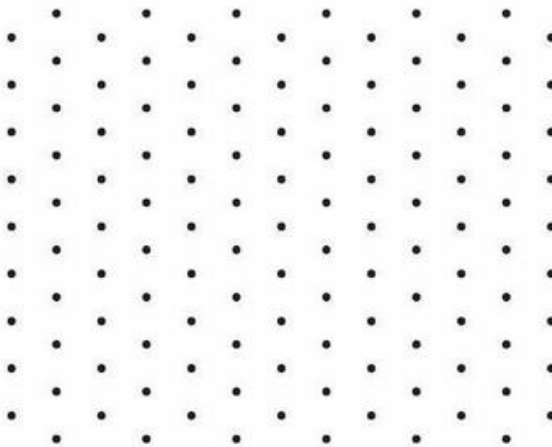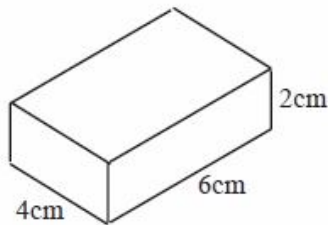
(4) The perimeter of a square is 20cm. Find the area of the square.

(5) Calculate $30.56 \div 8$

(6) A batch of 12 cookies requires 240g of flour. Find out how much flour is required to make a batch of 5 cookies.

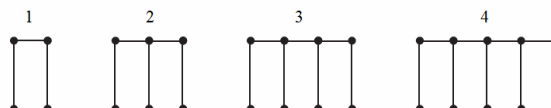(7) In a quadrilateral 3 of the angles are $30^o, 120^o$ and 150° respectively. Write down the size of the remaining angle.

(8) If $a = 4$ and $b = 6$ find the value of $\dfrac{a+b}{a}$ giving your answer as a fraction in its simplest form.

(9) Jenny travels at 4mph for 4 hours and 30 minutes. How far does she travel in that time?

(10) Simplify $2r - s + r + 7s$

Round 24 (Non Calculator)

(1) The mean of 5 different numbers is 6. Four of the numbers are 6, 4, 7 and 2 respectively. What is the 5th number?

(2) The range of a set of numbers is 24. The highest number is 9. What is the lowest number?

(3) Match the graph with the most suitable statement below:

(1) The sale of hot chocolate drinks and the temperature.
(2) The age of a family car and the value of a car.
(3) The colour of people's hair and the football team they support.

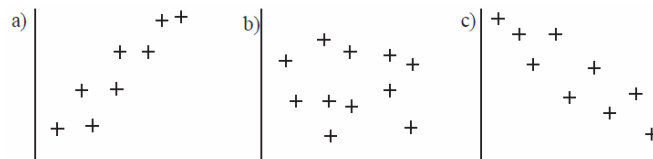
(4) Solve the equation $1 - 3x = 10$

(5) Which has the higher value?

(a) 25% of £50   *(b) $\dfrac{3}{5}$ of £25*

You must show how you decided.

(6) Circle the largest integer value in the list below:

$$3.9, \quad 4.7, \quad \frac{8}{9}, \quad 2, \quad 9.83, \quad 4, \quad 11.73$$

(7) The graph below shows the cost of hiring a football pitch. Smallville Town FC paid £115 when they used the pitch on a Saturday. Find an estimate for the number of hours they used the pitch for.
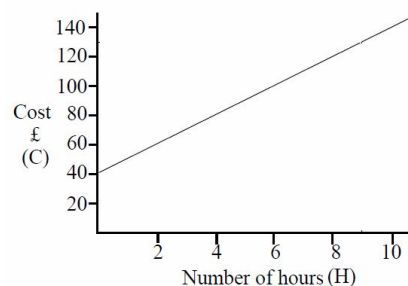
(8) Jane is thinking of a number. 20% of the number is 3.2. Find the number Jane is thinking about.

(9) In a bag there are 12 counters. Half of the counters are red, 2 are blue, 1 is black and the rest of the counters are yellow. Find the probability of pulling a yellow counter out of the bag if one counter is chosen at random.

(10) Write down the value of the second 4 in the number 4.34

Round 25 (Non Calculator)

(1) Find a number that appears on **both** of the number lines below.
Mark the number on **both** number lines with an arrow and state its value.

(2) Write down a number that is a multiple of 3 **and** a cube number.

(3) Draw the net of the triangular prism shown below.
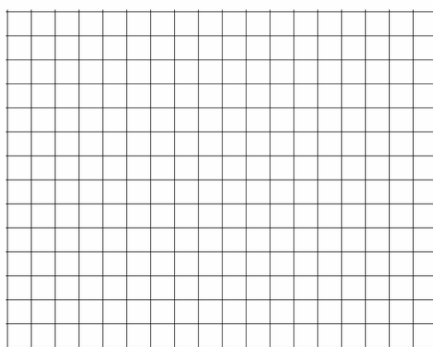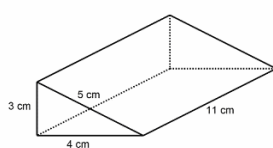
(4) Factorise $4x^2 + 6$

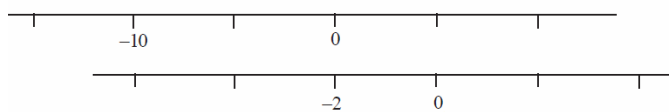(5) Write 42% as a fraction giving your answer in its simplest form.

(6) Name the 3 solids below
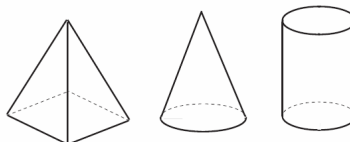
(7) Mary is reading a book with 1400 pages in. She is $\frac{5}{7}$ of the way through the book.

How many more pages has Mary got left to read?

(8) There are 3 different colour counters in a bag. Sue counts the counters and makes a frequency table to show the number of each colour in the bag. Draw a pie chart to represent the information.

Colour	Frequency
Red	25
Blue	50
Green	25

(9) Draw the locus of points 2cm from A.

A.

(10) Write down the reciprocal of 5 giving your answer as a decimal.

Round 26 (Non Calculator)

(1) Mark the points $A(2,1)$ and $B(-3,1)$ on the grid below. Mark a point C such that the points A, B and C make a right angled triangle.
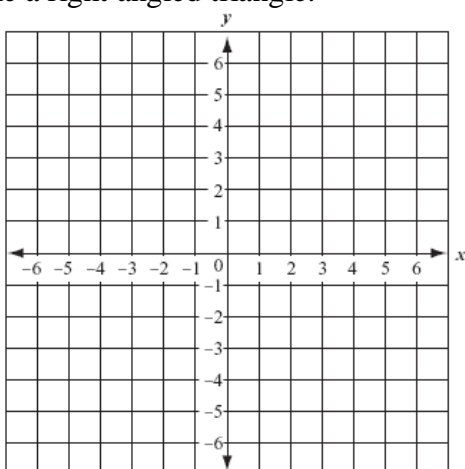
(2) n is an odd number. Complete the following sentence:

"$2n+1$ *is an* _____ *number*"

(3) Express 24 as a product of its prime factors.

(4) Complete the following sentence using two words:

"*25, 49, 1 and 36 are all* _____ _____"

(5) Find the value of y in the right angle triangle below.
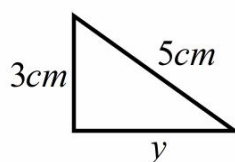
(6) Solve the equation $\dfrac{p}{5} + 2 = -1$

(7) Complete the sentence below:

"241° *is a* _____ *angle*"

(8) Find the value of $\dfrac{1}{4} + \dfrac{3}{8}$

(9) Round 235 to 1 significant figure.

(10) Write $\dfrac{3}{5}$ as a percentage.

Round 27 (Non Calculator)

(1) Find $\dfrac{6}{7}$ of £56

(2) Taking $\pi = 3$ find the area of the semicircle below.
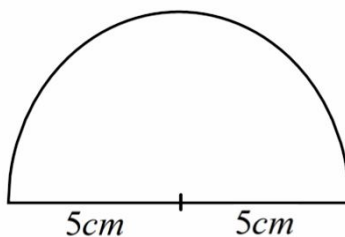
(3) Simplify $-3a - 2b - a + b$

(4) Bisect the acute angle below.
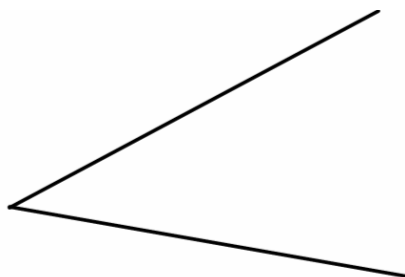
(5) Write a suitable question for a questionnaire about how often people use the internet.

(6) The range of the numbers below is 10. Find the value of the single digit number x.

$$3, x, 5, 11, 4, 7, 6, 7, 12, 3, 4, 7$$

(7) Fred buys a computer. Before VAT is applied the computer costs £380. If VAT is 20% work out how much Fred pays for the computer after VAT has been added.

(8) Find the lowest common multiple of 6, 8 and 12.

(9) In 5 years Caroline will be 43. How old will she be in 13 years?

(10) Convert 3mm into cm.

Round 28 (Non Calculator)

(1) Write down the order of rotational symmetry of the regular pentagon below.
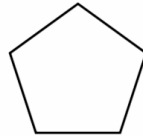
(2) Find the *nth* term formula for the sequence below:

3, 7, 11, 15, 19

(3) Complete the table below **and** draw the graph of $y = 2x - 1$ for $-2 \leq x \leq 2$

x	-2	-1	0	1	2
y					
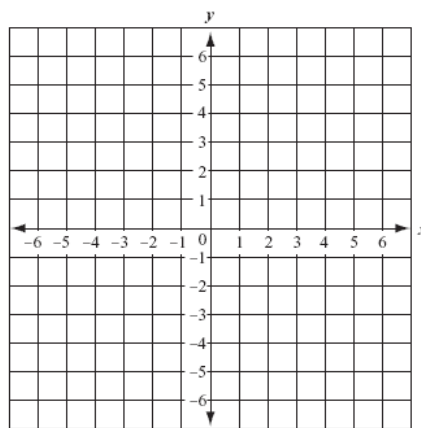
(4) The pictogram below shows the types of cars found in a local supermarket car park one day. Find how many more Vans there were in the car park than Classic Cars.

Represents 4 cars

Family Cars

Sports Cars

Vans

Taxi Cars

Classic Cars
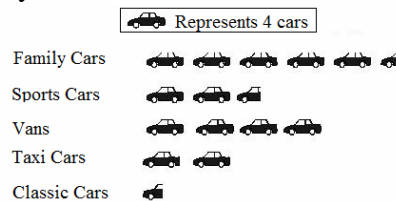
(5) Using the scale 1cm = 1000m find the distance from point A to point B giving your answer in km.

$A.$

$.B$

(6) Decrease £20 by 11%

(7) Simplify $p^5 \times p^2$

(8) Find the value $4p - 2q$ when $p = 2$ and $q = 4$.

(9) Pete starts work at 2.34pm and finishes at 16:12. How long does he work for?

(10) Find the value of $-2 - 6$

Round 29 (Non Calculator)

(1) Kate thinks of a number. 5% of her number is 6. What number is she thinking of?

(2) Circle one pair of congruent shapes in the picture below:
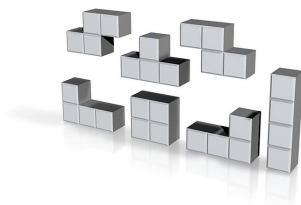
(3) From the list below circle a prime number (label it A) a non integer (label it B) and a factor of 35 (label it C). You **cannot** label the same number twice.

$$4, \ 7, \ 11, \ \frac{4}{3}, \ 16, \ 2.4, \ 125, \ 60$$

(4) Write $\frac{13}{4}$ as a mixed number.

(5) In a survey people had to pick their favourite colour from red, blue, green or yellow. 23% chose red, half chose blue and 9% chose green. What percentage of the people chose yellow?

(6) Using the exchange rate graph below find an estimate for how many Dollars ($) James would get if he exchanged £200 for Dollars ($).
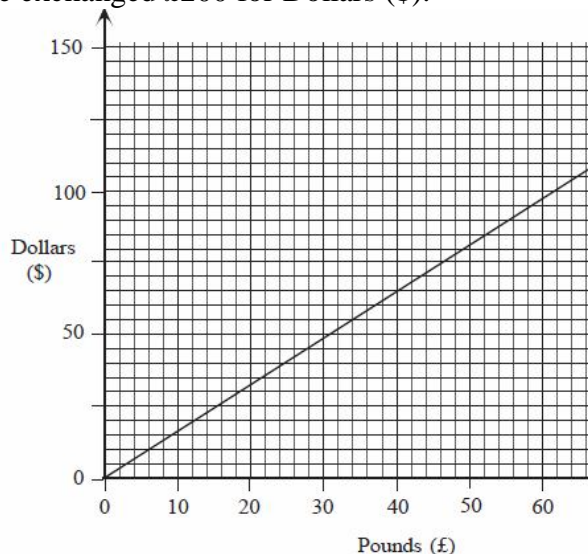
(7) Solve the equation $3n + 1 + n = 17$

(8) Insert 2 mathematical symbols to make the follow calculation true:
$$2 \_\_ 4 \_\_ 3 = 14$$

(9) Study the word below. Find the probability if one letter is chosen from random from the word the letter is an S.

SUCCESS

(10) x is a number Gail is thinking of. Write an expression for a number 4 times larger than the number Gail is thinking of.

Round 30 (Non Calculator)

(1) Put the fractions below in order of size, smallest to largest:
$$\frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{9}{16}$$

(2) Expand $x(5-x)$

(3) A tin of paint costs £8 and covers $6m^2$. Find the cost of painting the wall below. *(You may assume there is no waste)*

7m

4m
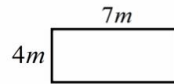
(4) Draw a shape that has no rotational symmetry.

(5) Fred uses the function machine below. His OUTPUT was 28. Find his INPUT.

INPUT × 3 + 4 OUTPUT
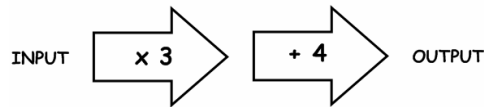
(6) Find the 3 figure bearing of B **from** A.

B

N

A
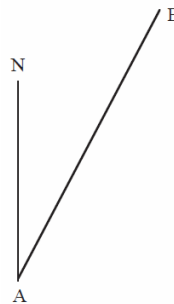
(7) Complete the chart below.

Favourite Food	Tally	Frequency
Pizza	JHT IIII	9
Chinese	III	
Chips		6
Other	JHT JHT II	12
	Total	

(8) The diagram below shows 3 equilateral triangles. Find the size of angle x.

x^o
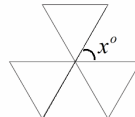
(9) Construct a triangle with 3 equal side lengths of 4cm.

(10) John is n years old. Sue is 5 years older than John. Write an expression for Sue's age.

Round 31 (Calculator Allowed)

(1) Find the value of $0.247 \times \sqrt{1683.2}$. Round your answer to 1 decimal place.

(2) John measures the temperature (in degrees C) each day for a week. His results are shown below. Find the difference between the highest and lowest temperatures.

$$2.74, \ 4.5, \ 9.231, \ 7.14, \ -2.74, \ 5.61, \ -2.89$$

(3) Describe fully the single transformation the maps shape A to shape B .
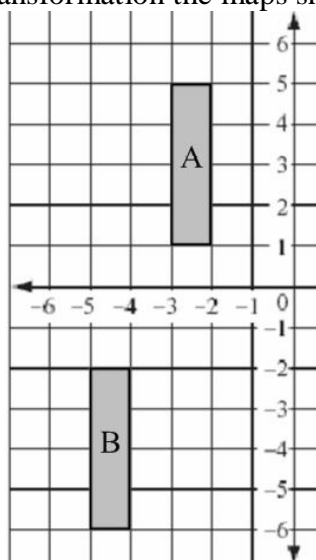
(4) Using the exchange rate £1 = $2.20 find the value in £ of $48.62.

(5) Sue sees a slogan "Possession is nine tenths of the law". If this is true how much of the law is not "Possession"?

(6) Find the area of the circle below giving your answer to 2 significant figures.

8cms
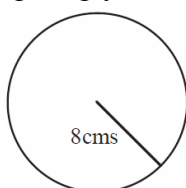
(7) The probability that Grace the Greyhound winds a race is 0.32. If Grace runs in 180 races how many would you expect her to win?

(8) Simplify the ratio $21 : 14 : 7$

(9) Pencils cost 10 pence each. Wendy buys n pencils. The shop keeper charges Wendy C pence in total. Write down an expression for the cost of the pencils in terms of C and n .

(10) Use the formula $C = 3w + 10$ to find the value of w when $C = 87$. Give your answer to 1 decimal place.

Round 32 (Calculator Allowed)

(1) Tony has a decrease in his wages of 17%. He was originally paid £394.67 a week. Find to nearest penny what he is paid after the decrease.

(2) Jane travels 41.5 miles in 2 hrs and 30 minutes. Find her average speed for the journey giving your answer to 2 significant figures.

(3) Write down all of the integers that satisfy the inequality $2 < x \leq 6$

(4) Find the next two numbers in the sequence below:

$$1, 2, 4, 7, 11, 16 \ldots$$

(5) Find the value of x giving your answer to 1 decimal place.
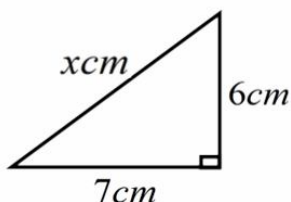
(6) Marking the following values on the number line below:

$$(A) \ \frac{1}{5}, \ \ (B) \ 0.45, \ \ (C) \ 0.67$$

(7) Convert 8m into kilometres.

(8) Find the value of x in the triangle below.
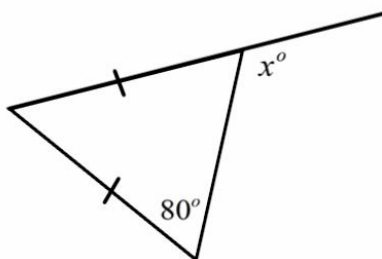
(9) Write down a number that is a factor of 50 **and** a square number.

(10) Simplify $2p \times 4q$

Round 33 (Calculator Allowed)

(1) Write $\dfrac{9}{4}$ as a mixed number.

(2) Draw an angle of 147°

(3) Circle the 3 fractions that have the same value below:
$$\frac{1}{5}, \frac{3}{25}, \frac{7}{10}, \frac{3}{15}, \frac{7}{35}$$

(4) 20 people were surveyed to find out their favourite drink.

25% said Coke, $\dfrac{1}{5}$ said Fanta, 0.1 said lemonade and the rest said milk. Draw a bar chart to show the information.

(5) Coaches leave the bus station at Town A every 20 minutes and start running from midday each day. The coach journey from Town A to Town B takes 70 minutes. Mike has to be in town B for 15:00hrs. What time will he need to catch the coach from Town A to get to Town B in time?

(6) Use the formula $y = x^2 - 2x$ to find y when $x = -1$.

(7) Find the volume of the prism below
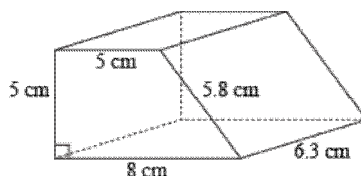
(8) Find the surface area of a cube with side lengths 6.3cm. Give your answer to the nearest whole number.

(9) Express 54 as a product of its prime factors.

(10) The frequency diagram below shows information from an experiment on the heights of plants. The plants were measured in cm. Label the graphs axes and find the total number of plants in the experiment.

Round 34 (Calculator Allowed)

(1). Ron played 46 games of chess. He said he won $\frac{3}{5}$ of his games. Explain why Ron is wrong.

(2) Jennifer took her husband and two children to the cinema. Adult tickets are priced at £8.20 each and the price for a child is half the price of an Adult ticket. A di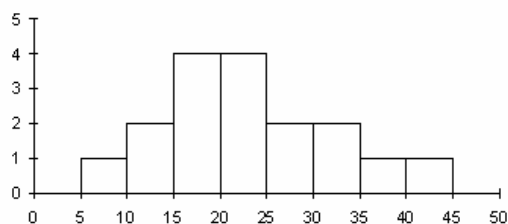scount of 10% is given to all purchases over £20. Find out how much change Jennifer would get from £30 after she paid for the 4 tickets.

(3) Find the value of $\dfrac{3.2+\sqrt{17.14}}{0.245}$ giving your answer to 2 significant figures.

(4) John is making a banana cake. He uses 300g of bananas. The recipe includes sugar, bananas and flour in the ratio $3:5:1$. How much more sugar did John use than flour when he made the cake? *(All ingredients are measured in grams)*.

(5) Find the size of the exterior angle of an equilateral triangle.

(6) Find the total surface area of the closed top box shown below.
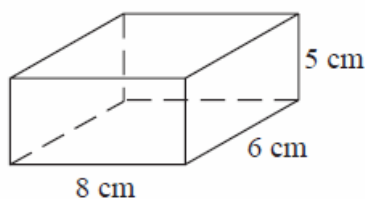
(7) Create a perpendicular bisector of the line AB.

A —————————— B

(8) A map of Town A has the scale 1:25000. Sue measures a line of 3cm on the map. How many meters would this represent in Town A?

(9) Solve the equation $3x-4 = x+7$

(10) Bill thinks of a number. He squares the number and the answer is 25. Ben says his number must be 5. Is Ben correct? You must give a reason for your answer.

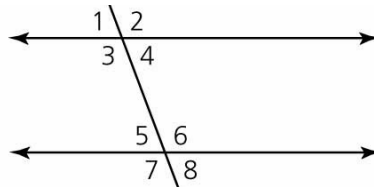**Round 35 (Calculator Allowed)**

(1) Increase 247 by 13.5% giving your answer to 2 significant figures.

(2) Bob travels 47 miles in 1 hour and 45 minutes. Find his average speed giving your answer to the nearest integer.

(3) Construct an accurate drawing of a triangle with side lengths 4cm, 5cm and 7cm.

(4) Explain why angle 2 and angle 6 have the same value.

(5) Given angle $5 = 80^o$, find the value of angle 3 giving a reason for your answer.
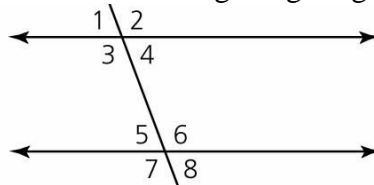
(6) Put the following numbers in order of size, smallest first:

0.221, 0.2201, 2.221, 22.0, 0.20992, 2.192

(7) Sketch a cube with a volume of $27cm^3$ showing the dimensions of the cube.

(8) It takes 1 man 8 days to build a wall. How long would it take 4 men to build the same wall if they worked at the same rate?

(9) A biased dice has 6 faces. The probability of rolling a number 1,2,3,4,5 and 6 on the dice are shown below. Find the probability or rolling a number 3 on the dice.

Number	1	2	3	4	5	6
Probability	0.2	x	x	0.25	0.05	0.1

(10) Find the highest common factor of 10 and 25.

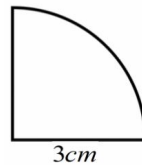## Round 36 (Calculator Allowed)

(1) Karen spends some money at a shop. She pays with a two pound coin. The shopkeeper gives her the change. There are 4 coins in total and they are all different. What is the least amount of money she could have spent in the shop?

(2) Multiply out $-2x(3-5x)$

(3) Find the area of the quarter circle below giving your answer to 1 decimal place.

3cm

(4) In a game teams are awarded one point for winning a game, none for drawing and have a point subtracted for losing. Team A played 5 games and finished with a score of -2. Write down one possible set of results for the 5 games.

(5) Two fair die are rolled and their scores added together. Complete the sample space below and find the probability of scoring less than a total of 4 when both die are rolled. Give your answer as a simplified fraction.

Second die

		1	2	3	4	5	6
	1	2	3	4	5	6	7
	2	3		5	6	7	8
	3	4	5		7		9
First die	**4**	5		7	8		10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	

(6) Money is shared is a ratio $5:3:1$. Pat was given the largest share. The smallest share was worth £1.25. How much money did Pat get?

(7) Write 35g in kg.

(8) Simplify $p^5 \div p$

(9) Find the volume of the cylinder with a radius of $4cm$ and a height of $10cm$.

10cm

4cm
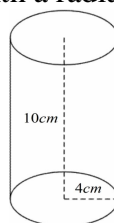
(10) Write the number *Twelve thousand three hundred and fifty two* in numbers.

Round 37 (Calculator allowed)

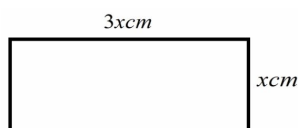(1) Sarah is thinking of 2 different positive integers. The difference between the two numbers is 7. One number is a single digit number and the other is a double digit number. Write down one possible combination of the 2 different numbers Sarah is thinking of.

(2) Given the perimeter of the rectangle below is 18cm find the value of x.

$3x cm$

$x cm$

(3) Find $\dfrac{10}{13}$ of 638 rounding your answer to 2 significant figures.

(4) What fraction of the larger rectangle's area below is shaded? Give your answer as a simplified fraction.

6cm

2cm

1cm

2cm
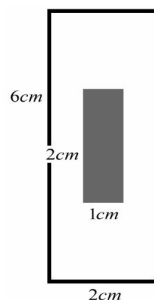
(5) In a supermarket a box of 12 biscuits is priced at £1.83. A box of 21 of the same biscuits is priced at £3.43. Show that the box of 12 biscuits is better value.

(6) On average it rains twice every 7 days. How many days would you expect it to rain in half a year?

(7) Use the method of trial and improvement to find a solution to the equation $x^2 + 2x = 33$ to one decimal place. The answer lies between 4 and 5.

(8) Draw an ordered stem and leaf diagram for the data below. You must show your key.

$$0.2, \ 3.4, \ 4.1, \ 1.6, \ 0.2, \ 0.4, \ 1.3, \ 1.1$$

(9) Sketch a parallelogram with an area of $24 cm^2$ including its dimensions.

(10) Write the value of the 3 in the number 10032.67

Round 38 (Calculator Allowed)

(1) Using the formula $C = 3P - 5.1$ find the value of P when $C = 3.75$ giving your answer to 1 decimal place.

(2) The bearing of B from A is 110° as shown in the diagram below. Find the bearing of A from B. *(The diagram is not drawn accurately).*
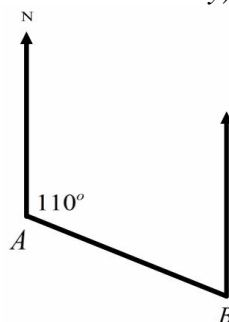
(3) Find the area of the trapezium below giving your answer to 2 significant figures.
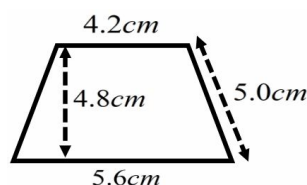
(4) A pair of shoes cost £52.50 in the UK. In the USA they are $82.30. The exchange rate is £1=$1.60. Where is it cheaper to buy the shoes? You must show your workings.

(5) Jane has been off ill for 7 of the 243 days she was due to work this year. Write the number of days off ill she had as a percentage giving your answer to the nearest 1 percent.

(6) It takes John 8 minutes to complete one maths question and it takes Fred 6 minutes to complete one maths question. John and Fred both start answering questions at 1pm. They both finish a question at exactly the same time. Give one possible time when this could happen.

(7) Town A is due west of Town B. Town C is due east of Town B. The distance from Town A to Town B is 3.15km. The distance from Town C to Town B is 2.8km. Find the distance from Town A from Town C giving your answer in meters.

(8) In Finland the temperature is $-11^o c$ and in Russia the temperature is $-6.5^o c$. Which country is warmer and by how much?

(9) Harley did a survey on the foods people like. She put the information in a pie chart. The section for Pizza was 45^0. Given 3 people chose Pizza find the number of people she asked.
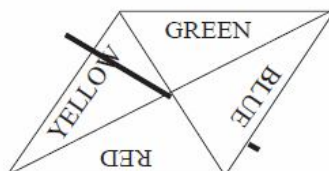
(10) Write a metric unit for measuring the capacity of bucket of water.

Round 39 (Calculator Allowed)

(1) Find the difference between the numbers -1.87 and -9.21.

(2) Factorise $2x^2 + 4x$

(3) The diagram below shows a fair spinner with 4 equally sized sections. Mike did an experiment and carried out n spins. The spinner landed on Yellow 412 times. Estimate the value of n.

(4) Find the length of the missing side of the right angled triangle below. Give your answer to 1 decimal place.

(5) One fifth of a number is 6.3. Find the number.

(6) Simplify $2p \times 3p \times 5p$

(7) Draw an obtuse angle greater than 150°

(8) A recipe for 12 cakes requires 3 eggs. How many eggs are required for 8 cakes?

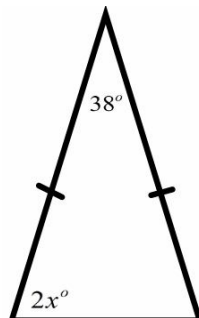(9) The mean of the numbers below is 5. Find the value of x.

$$2, \ 5, \ 7, \ 6, \ 3, \ x, \ 7, \ 8$$

(10) A fair spinner and fair 6 sided dice are shown below. The spinner is spun once and the dice is rolled once. Their scores are then added together. Write down all the possible ways a combined score of 4 can be achieved.
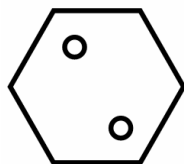
(1) Find the value of x in the triangle below.

(2) Express 54 as a product of its prime factors.

(3) Pete travels at 48mph for 2 hours and 15 minutes. How far does he travel?
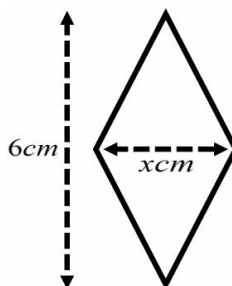
(4) Draw the lines of symmetry on the regular hexagon shown below:

(5) A boat travel due north east. Write down the bearing the boat is moving on.

(6) Solve the equation $6(x-1) = 3(x+4)$

(7) The area of the kite below is $9cm^2$. Find the value of x.

(8) Write the ratio $7:3$ in the form $n:1$

(9) A bus leaves Smallville at quarter past 11 in the morning and arrives in Large Town at 14:09. The bus stopped for 12 minutes. Find out how long it takes to drive from Smallville to Large Town non-stop.

(10) A cylinder has a volume of $330cm^3$. The area of the circular cross section is $48cm^2$. Find the height of the cylinder.
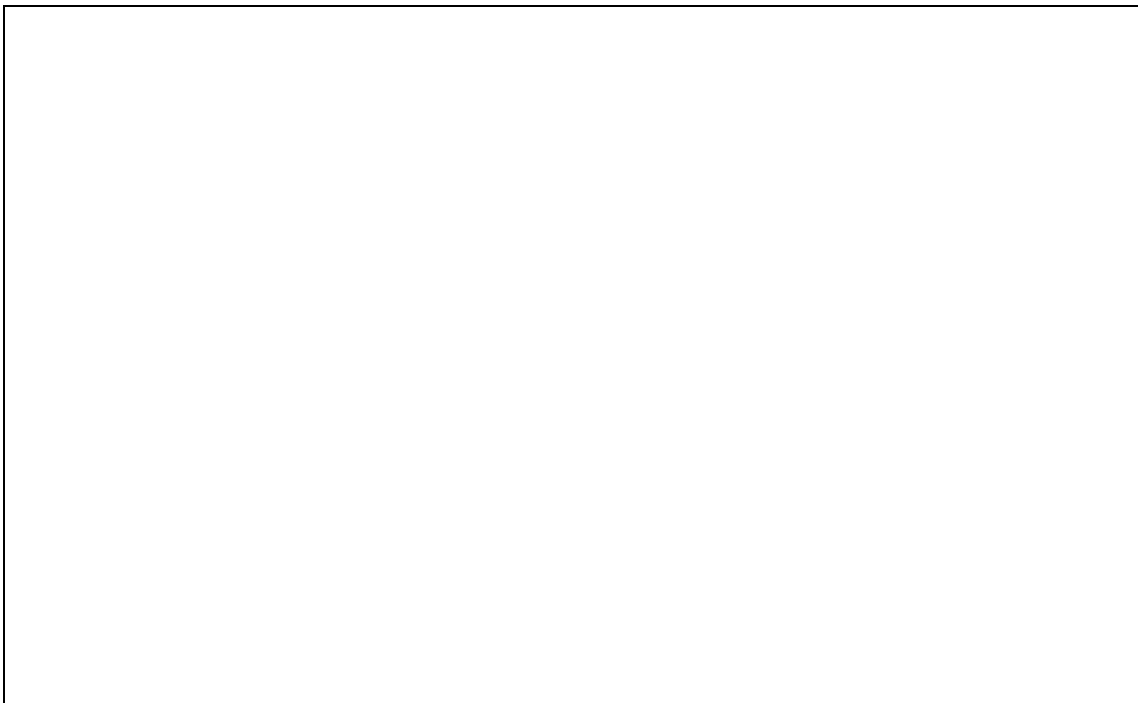
Assessment

Round	Score	Topics to focus on
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<u>Student Evaluation</u>

<u>Teacher Evaluation</u>

<u>Help</u>

All topics are covered in the 40 rounds are at www.m4ths.com