Day 1: Pie Charts & Stem and Leaf

Question 1

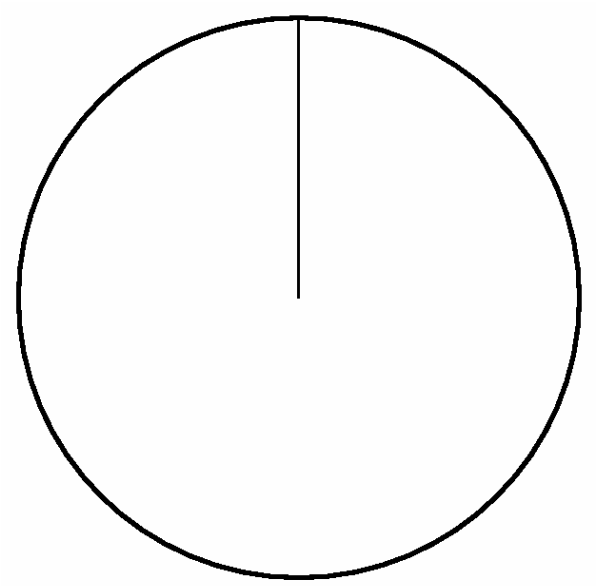
Patrick carried out a survey of 45 pupils in Year 11.
He asked how many books they had borrowed from the library in the last month.
These are Patrick's results.

4,	6,	3,	9,	10,	5,	4,	7,	6,	3,	8,	3,	1,	9,	0,
12,	5,	6,	3,	3,	0,	7,	9,	4,	3,	8,	2,	1,	6,	1,
3,	4,	6,	0,	7,	10,	4,	8,	1,	6,	7,	1,	2,	3,	1.

a Complete the frequency table.

Number of books	Tally	Frequency
0 to 2		
3 to 5		
6 to 8		
more than 8		6

b Construct a pie chart to show this information.



Question 2

Here are the times, in minutes, taken to change some tyres**.**

5	10	15	12	8	7	20	35	24	15
20	33	15	25	10	8	10	20	16	10

In the space below, draw a stem and leaf diagram to show these times

0
10
20
30

Key 10| 5 = 15

Day 2: Fractions

Question 1

$y = ab + c$

Calculate the value of y when

$a = \frac{3}{4}$, b = $\frac{7}{8}$ and $c = -\frac{1}{2}$

Give your answer in the form $\frac{p}{q}$ where p and q are integers.

Question 2

Lisa used $\frac{1}{2}$ of her lottery win to buy a house.

She gave $\frac{1}{6}$ of her lottery win to a charity.

Lisa then shared the remainder of her lottery win equally between her four children.

Work out the fraction of Lisa's lottery win that each of her four children received.

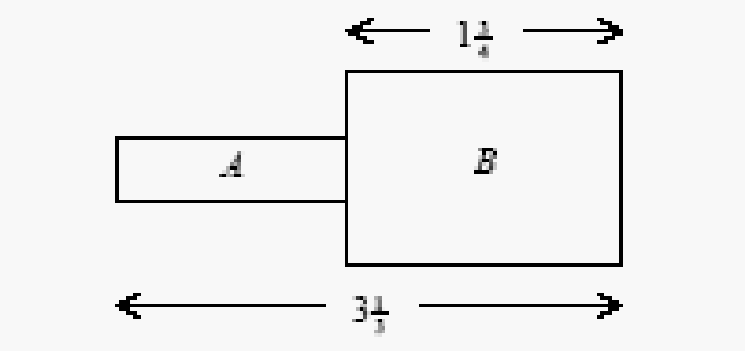
Question 3

Two rods are fastened together.

The total length is $3\frac{1}{3}$ inches.

The length of rod B is $1\frac{3}{4}$ inches.

Find the length of rod A.



Day 3: Algebra

Question 1
Simplify:
i $2x + 3x$

ii $h \times h \times h \times h \times h$

iii $2m \times 3n$

iv $2(x + 3) + 5(x - 3)$

Question 2
a Factorise completely $15x + 3x^2$

b Expand $2a(4 - a)$

c Expand and simplify $(2c + 3)(c - 4)$

Question 3
Put brackets in each expression so that each statement is true.

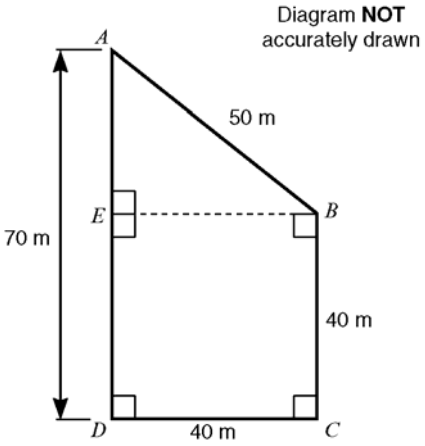
a) $14.5 - 2.6 \times 4.5 - 3.6 = 49.95$

b) $14.5 - 2.6 \times 4.5 - 3.6 = 10.71$

Day 4: Area

Question 1

a Work out the perimeter of the whole shape *ABCD*.



In part b you must write down the units with your answer.

b Work out the area of

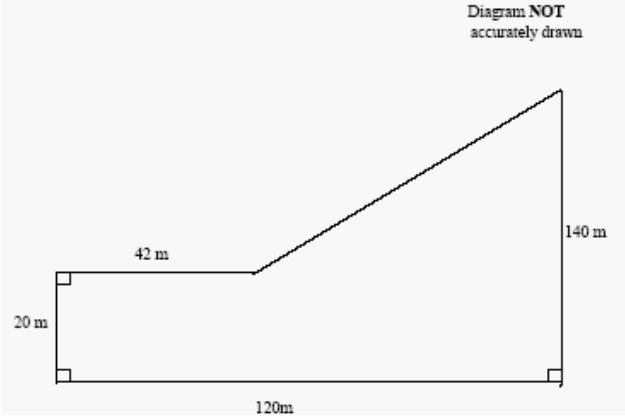
i the square *EBCD*,

ii the triangle *ABE*.

Question 2

A cube has surface area 24 cm^2. Work out the volume of the cube.

Question 3



The diagram shows a carpark.
Mrs Roberts is selling the car park. She will accept any offer that is more than £28 per square metre.

Mr Patel offers £194 700 for the carpark.
Will Mrs Roberts accept Mr Patel's offer for the carpark?

You must show how you reached your decision.

Day 5: Estimation

Question 1

Matthew uses this formula to calculate the value of D.

$$D = \frac{a - 3c}{a - c^2}$$

a Calculate the value of D when $a = 19.9$ and $c = 4.05$. Write down all the figures on your calculator display.

Matthew estimates the value of D without using a calculator.

b i Write down an approximate value for each of a and c that Matthew could use to estimate the value of D.

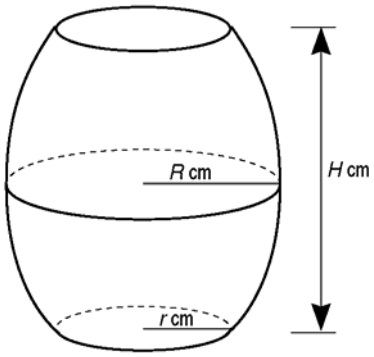
ii Work out the estimate that these approximations give for the value of D. Show all your working.

Question 2

The volume, V, of the barrel is given by the formula

$$V = \frac{\pi H(2R^2 + r^2)}{3000}$$

$\pi = 3.14$, $H = 60$, $R = 25$ and $r = 20$.



Calculate the value of V.
Give your answer correct to 3 significant figures.

Day 6: Percentages

Question 1

Frances see three different advertisements for jeans.

Work out the cost of the jeans in each advertisement.

i Bobs

ii Disco's

iii Sanjay's

Question 2

Mustapha pays Income Tax at 22%.
He is allowed to earn £3 500 before he pays any Income Tax.
He earns £12 500 in one year.
Work out how much Income Tax he pays in that year.

Question 3

John puts £2000 in the bank, which pays interest at the rate of 2.4% per year. Simple interest. Calculate how much he would have in the bank after 2 years.

Day 7: Equations

Question 1
Solve the following equations.
a $4x - 7 = 20$

b $3(y + 5) = 42$

Question 2
Solve the following equations:
i $3p + 5 = 29$

ii $5(q - 3) = 25$

iii $6r - 5 = 7 - 2r$

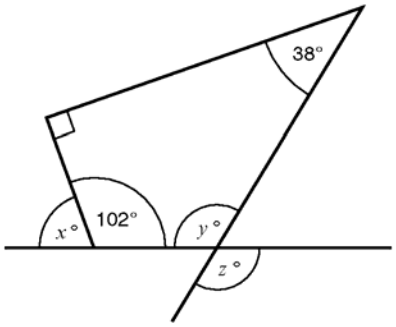
Question 3
Solve the equation

$$\frac{4x + 33}{5} = 3x$$

Day 8: Angles

Question 1

Diagram **NOT** accurately drawn



a i Work out the value of x in the diagram below.

ii Give a reason for your answer.

b i Work out the value of y.

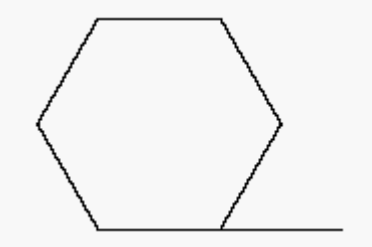
ii Give a reason for your answer.

c i Work out the value of z.

ii Give a reason for your answer.

Question 2

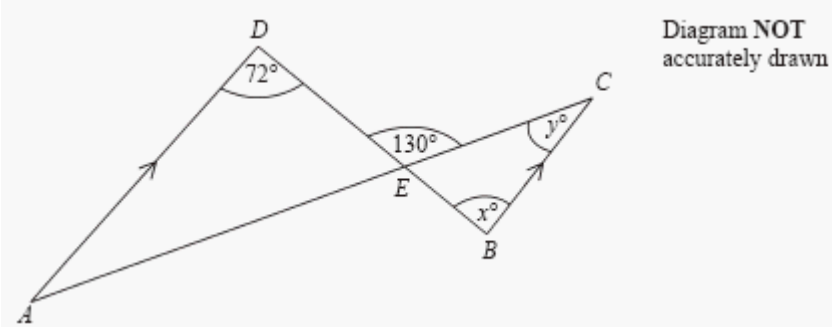
a) Work out the size of an exterior angle of a regular hexagon



b) Hence or otherwise work out the interior angle of a regular hexagon

Question 3

Diagram **NOT** accurately drawn



AC and BD are straight lines which cross at E.
AD is parallel to BC.

a i Find the size of the angle marked x^o.

ii Give a reason for your answer.

b i Find the size of the angle marked y^o

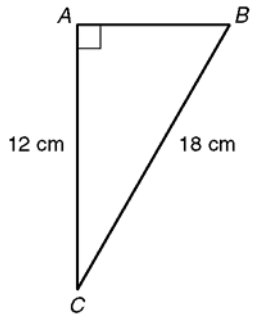
ii Give a reason for your answer.

Day 9: Pythagoras

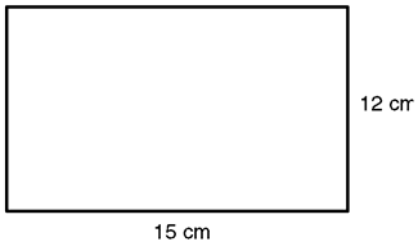
Question 1
Calculate the length of *AB*.

Give your answer correct to 1 decimal place.

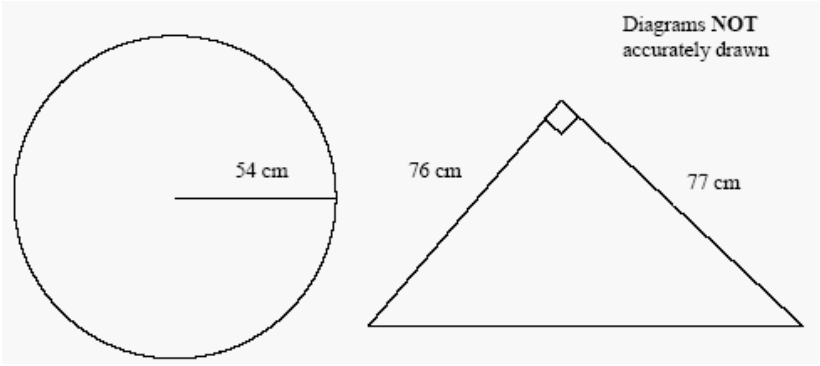
Diagram **NOT** accurately drawn



Question 2
Calculate the length of a diagonal of this rectangle.
Give your answer in centimetres correct to one decimal place.



Question 3

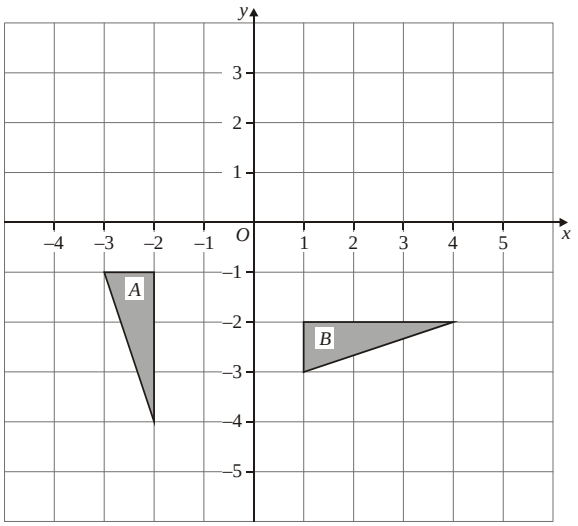


The diagrams show the circular top of a cylinder and a piece of plastic in the shape of a right-angled triangle. The two shorter sides of the triangle have lengths 76cm and 77cm.

Show that the triangular piece of plastic cannot completely fit on the top of the cylinder without overlapping.

Day 10: Transformations

Question 1.



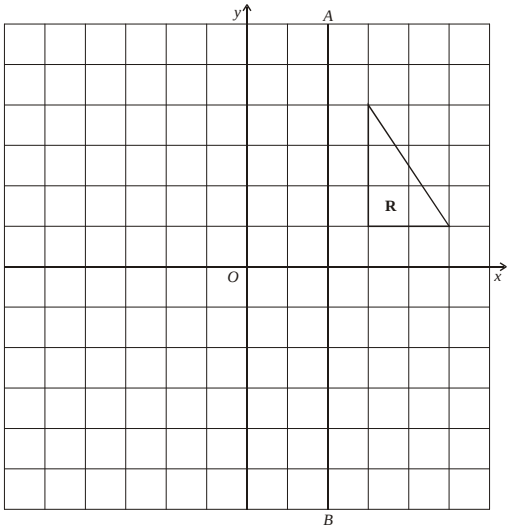
Describe fully the single transformation that maps shape **A** onto shape **B**.

……..…….....

……...……

(Total 3 marks)

Question 2.



(a) Reflect triangle **R** in the line *AB*.
Label the new triangle **S**.

(1)

(b) Rotate triangle **R** a half turn about the point *O*.
Label the new triangle **T**.

(2)

Question 3.

Describe fully the single transformation which

takes shape **A** onto shape **B**.

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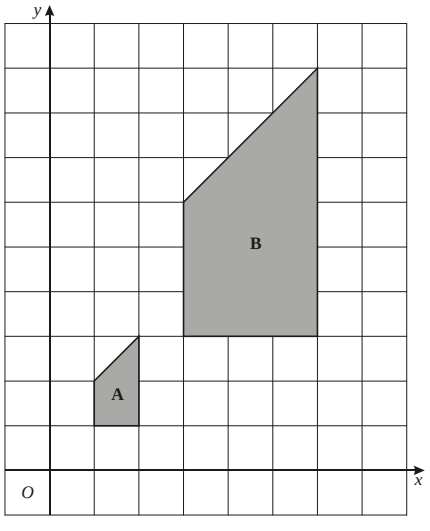


(Total 3 marks)

Answers

Day 1

Question 1

a) 11, 15, 13

b) angles 88º, 120º, 104º, 48º

Question 2

0	5788
10	000025556
20	00045
30	35

Key 10|5 = 15

Day 2

Question 1

(21 - 16)/32 = 5/32

Question 2

1/12

Question 3

1 7/12

Day 3

Question 1

i) $5x$

ii) h^5

iii) $6\,mn$

iv) $7x - 9$

Question 2

a) i) $2t(2s + 4u - v)$

ii) $3x(5 + x)$

b) $8a - 2a^2$

c) $2c^2 - 8c + 3c - 12 = 2c^2 - 5c - 12$

Question 3

a) **(** 14.5 - 2.6 **)** × 4.5 - 3.6 = 49.95

b) **(** 14.5 - 2.6 **)** ×**(** 4.5 - 3.6 **)** = 10.71

Day 4

Question 1

a) 40 + 40 + 50 + 70 = 200

b) i) $40 \times 40 = 1600$ m^2

ii) $(40 \times 30) \div 2 = 600$ m^2

Question 2

8cm^3

Question 3

Area of CP $= 42 \times 20 + \left(\frac{20+140}{2}\right) \times (120 - 42)$ oe

$= 840 + 6240 = 7080$

She will accept more than 28 × "7080"

= 198240 so She will NOT accept.

Day 5

Question 1

a)

$$\frac{19.9 - 3 \times 4.05}{19.9 - 4.05^2}$$

$$= \frac{7.75}{3.4975} = 2.215868477$$

b) i) $a = 20$, $c = 4$

ii) $\frac{20-12}{20-16} = \frac{8}{4} = 2$

Question 2

$V = 104$

Day 6

Question 1

i) 30 - (30 × 15/100) = £25.50

ii) 36 × 2/3 = £24

iii) 22 + (22 × 17.5/100) = £25.85

Question 2

12 500 - 3 500 = 9000

9000 × 22 ÷ 100 = £1980

Question 3

£48 x 2 = £96

Answer = £2096

Day 7

Question 1

a) $x = 27 \div 4 = 6.75$

b) $y = 9$

Question 2

a) i) 10.083

ii) 9

iii) 9

iv) 9.5

b) i) $^1/_6$

ii) ½

Question 3

$x = 3$

Day 8

Question 1

a) i) 78º

ii) angle on a straight line

b) i) 130º

ii) angles in a triangle, or in any 4-sided shape

c) i) same as b)i) = 130º

ii) (vertically) opp., X-angles

Question 2

60º

Question 3

a) i) 72º

ii) alternate angles

b) i) 58º

ii) angles in a straight line, angle CEB = 50º

angle sum of triangle, 180º - 72º - 50º = 58º

Day 9

Question 1

$\sqrt{(18^2 - 12^2)} = 13.4$

Question 2

$\sqrt{(15^2 + 12^2)} = 19.2$ cm

Question 3

x = 108.1896…..

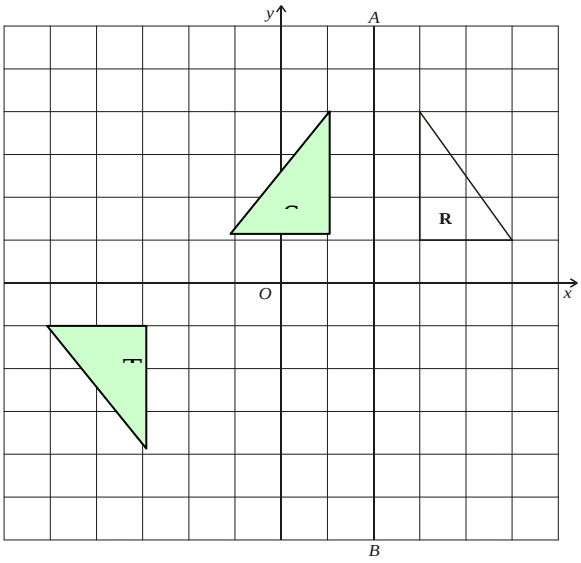
>diameter (108) of the circular top

Day 10

Question 1 – rotation 90 degrees anticlockwise about the origin.

Question 2 –

a) triangle S correct position



b) triangle T-correct position

Question 3

Enlargement Scale factor 3 centre O.