GOING FOR GOLD

Problem Solving

Gold Paper 4

Q	Topic	My Mark	Maximum Marks
1	Ratio		4
2	Probability		5
3	Polygons		3
4	Area		6
5	Pythagoras		3
6	Forming and solving equations		4
7	Percentages		4
8	Circle		5
9	Exchange rates and proportion		5
10	Volume and surface area		4
			43

Question 1 - Ratio

Peter makes a large amount of pink paint by mixing red and white paint in the ratio 2 : 3

Red paint costs £80 per 10 litres

White paint costs £15 per 10 litres.

Peter sells his pink paint in 10-litre tins for £60 per tin.

Calculate how much profit he makes for each tin he sells.

(4 marks)

Question 2 - Probability

There are only red counters, blue counters and green counters in a bag. There are 5 red counters. There are 6 blue counters. There is 1 green counter.
Jim takes at random a counter from the bag.

(a)   (i) Work out the probability that he takes a red counter.

       (ii) Work out the probability that he takes a counter that is not red.

(3 marks)

Jim puts the counter back in the bag. He then puts some more green counters into the bag. The probability of taking at random a red counter is now $\frac{1}{3}$.
(b) Work out the number of green counters that are now in the bag.
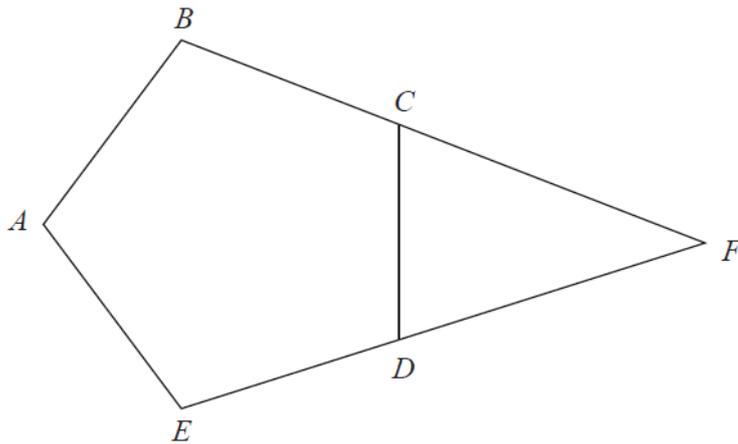
(2 marks)

Question 3 - Polygons

Diagram **NOT** accurately drawn

ABCDE is a regular pentagon.

BCF and *EDF* are straight lines.

Work out the size of angle *CFD*.

You must show how you got your answer.

(3 marks)

Question 4 - Area

Jenny is redecorating her bathroom, which is 2.8m wide, 3.5m long and 3m high.

She tiles one of the smaller walls and paints the other 3 walls.

The tiles are 35cm by 70cm and are sold in boxes of 10.

Each box costs £15.

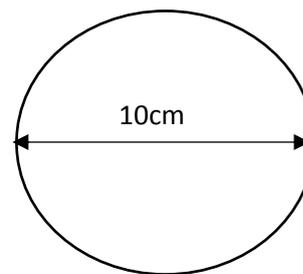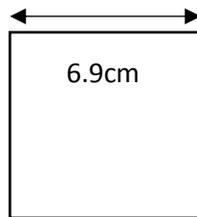Paint is sold in tins which costs £8.99 and covers 4.5 square metres.

Which will cost her more the paint or the tiles? How much more?

(6 marks)

Question 5 - Pythagoras

A circle has a diameter of 10cm.

A square has side lengths of 6.9cm.
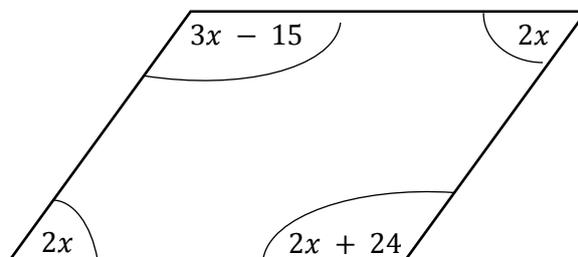
6.9cm

10cm

Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

(3 marks)

Question 6 - Forming and solving equations

The diagram shows a parallelogram.

Work out the sizes of the angles in the parallelogram.

$3x - 15$ $2x$

$2x$ $2x + 24$

(4 marks)

Question 7 - Percentages

The pressure at sea level is 101325 Pascals.

Any rise of 1km above sea level decreases the pressures by 14%.

For example,

At 3km above sea level the pressure is 14% less than at 2km.

Work out the pressure at 4km above sea level.
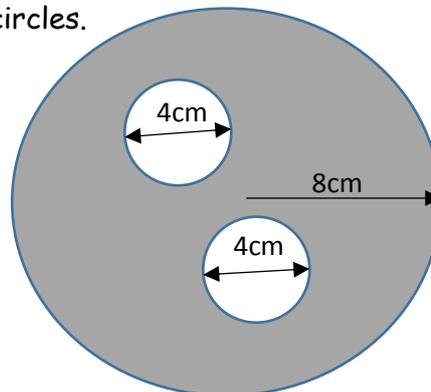
Give your answer to 2 significant figures.

(4 marks)

Question 8 - Circle

The diagram shows a large circle and two small circles.

The large circle has a radius of 8cm.

The two smaller circles have a diameter of 4cm.

Find the shaded area.

(5 marks)

Question 9 - Exchange rates and proportion

Linda is going on holiday to the Czech Republic.
She needs to change some money into koruna.

She can only change her money into 100 koruna notes.

Linda only wants to change up to £200 into koruna.
She wants as many 100 koruna notes as possible.

The exchange rate is £1 = 25.82 koruna.

How many 100 koruna notes should she get?

(5 marks)

Question 10 - Volume and surface area

The cross sectional area of shape A is 28cm².

It has a volume that is $1\frac{1}{2}$ times that of shape B.   (4 marks)

What is the length x of shape A.

A

B

x cm

28cm²

7cm

10cm

6cm

(4 marks)