

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Ratio, Proportion and Rates of Change

Estimating and measuring, using appropriate units

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

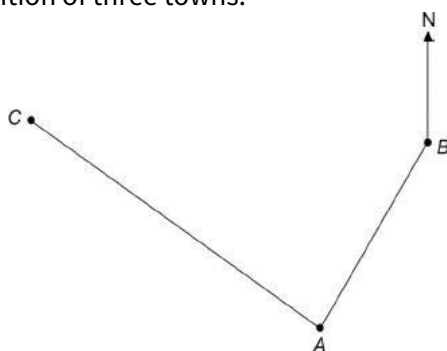
- In all calculations, show clearly how you work out your answer

For questions 1 to 11 you must **NOT** use a calculator.



Q1.

The diagram shows the position of three towns.



Scale: 1 cm represents 50 km

(a) Write down the three-figure bearing of *A* from *B*.

(1)

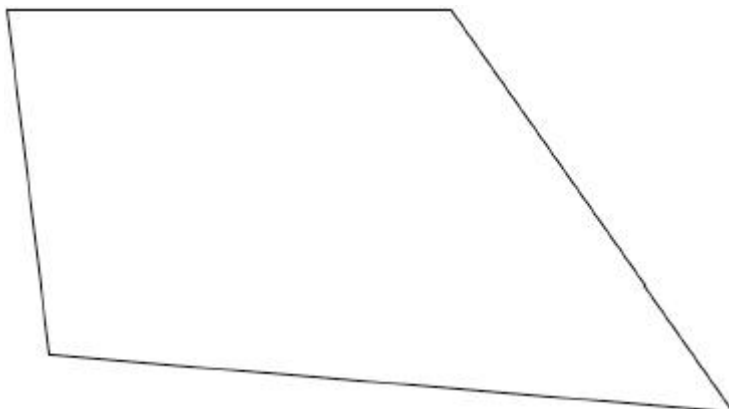
(b) Work out the actual straight line distance from *C* to *A*.

(2)

(Total 3 marks)

Q2.

Here is a quadrilateral.



Use a protractor to measure the size of the **smallest** angle.

(Total 1 mark)

Q3.

Here is a square.



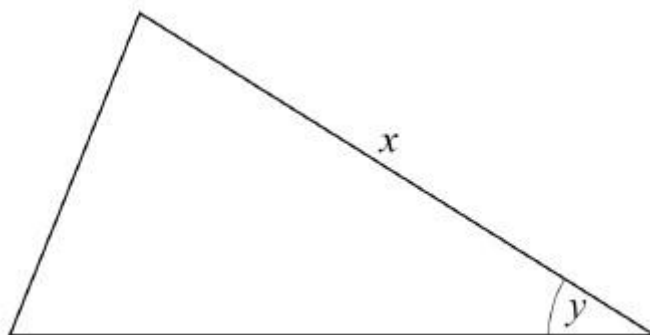
Use a ruler to measure a side length of the square.

Give your answer in **millimetres**.

(Total 1 mark)

Q4.

Here is a triangle.



- (a) Measure the length of side x .
Give your answer in millimetres.

(1)

- (b) Measure angle y .

(1)

(Total 2 marks)

Q5.

Here is a map of France.



Scale: 1 cm represents 80 km

- (a) Estimate the time it would take to drive from Paris to Marseille.

Assume

- the road is straight
- an average speed of 100 km/h

(4)

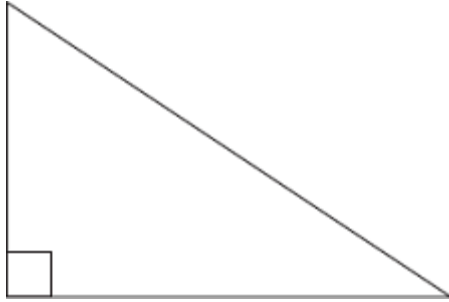
- (b) Comment on how each assumption affects the accuracy of your estimate.

(2)

(Total 6 marks)

Q6.

This triangle is **drawn accurately**.



Work out the area of the triangle.

(Total 3 marks)

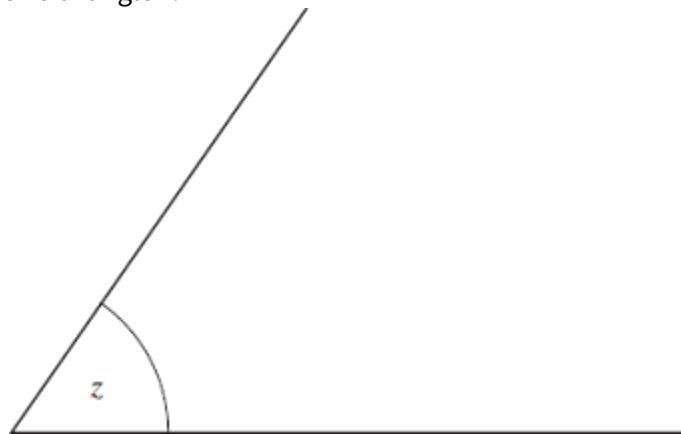
Q7.

- (a) Measure the length of this line.
Give your answer in centimetres.



(1)

- (b) Measure the size of angle z .

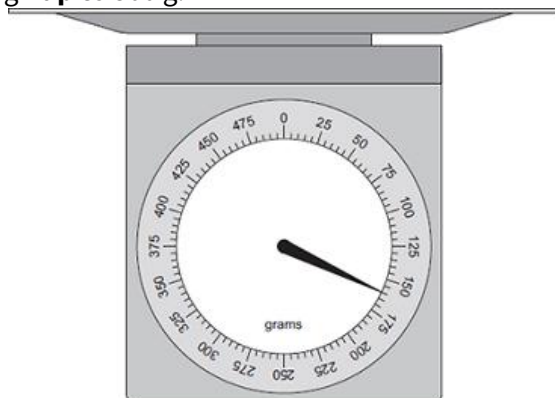


(1)

(Total 2 marks)

Q8.

Ann has scales that weigh **up to** 500 g.



- (a) Ann uses the scales to weigh a letter.
How much does the letter weigh?

(1)

- (b) This table shows the cost of sending letters by First Class or by Second Class post.

Weight	First Class	Second Class
1 g to 100 g	£0.60	£0.50
101 g to 250 g	£1.20	£1.10
251 g to 500 g	£1.60	£1.40
501 g to 750 g	£2.30	£1.90

How much will it cost Ann to send her letter by **First Class** post?

(1)

- (c) Baz wants to post **two** letters.
The letters weigh 200 g and 400 g.
How much cheaper is it to send both letters by Second Class post than by First Class post?

(3)

- (d) Ann's scales only weigh up to 500 g.
She needs to weigh 750 g of flour.
How can she do this using her scales?

(2)

(Total 7 marks)

Q9.

- (a) Choose the most suitable unit to measure the distance from one town to another.
Circle your answer.

centimetres

metres

kilometres

(1)

- (b) Choose the most suitable unit to measure the volume of a dustbin.
Circle your answer.

millilitres

centilitres

litres

(1)

- (c) Choose the most suitable unit to measure the weight of a pencil.
Circle your answer.

grams

kilograms

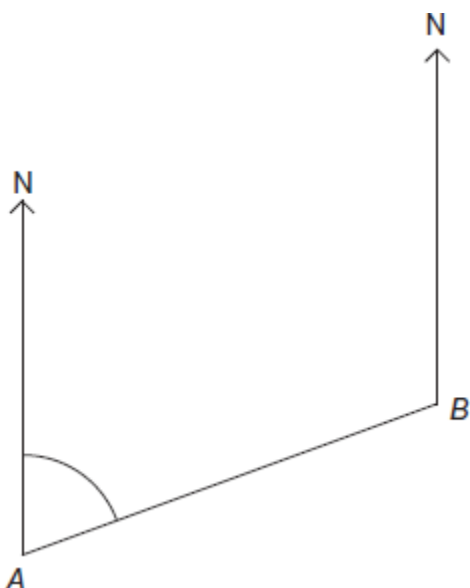
tonnes

(1)

(Total 3 marks)

Q10.

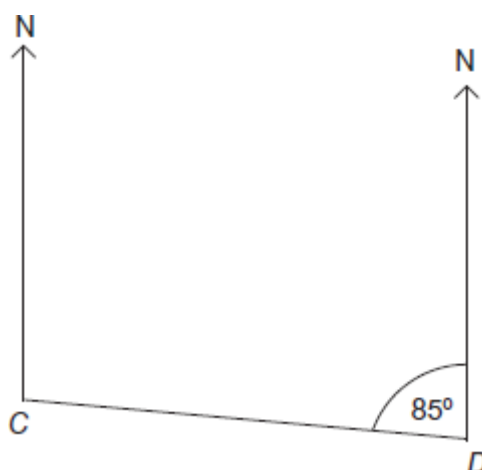
(a)



Measure and write down the **three-figure** bearing of B from A.

(1)

(b)



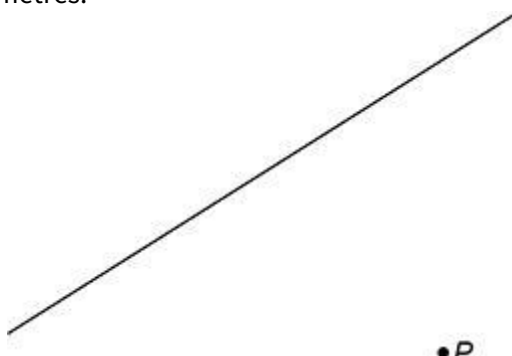
Work out the **three-figure** bearing of D from C.

(1)

(Total 2 marks)

Q11.

Measure the **shortest** distance from point P to the line.
Give your answer in millimetres.



Answer _____ mm

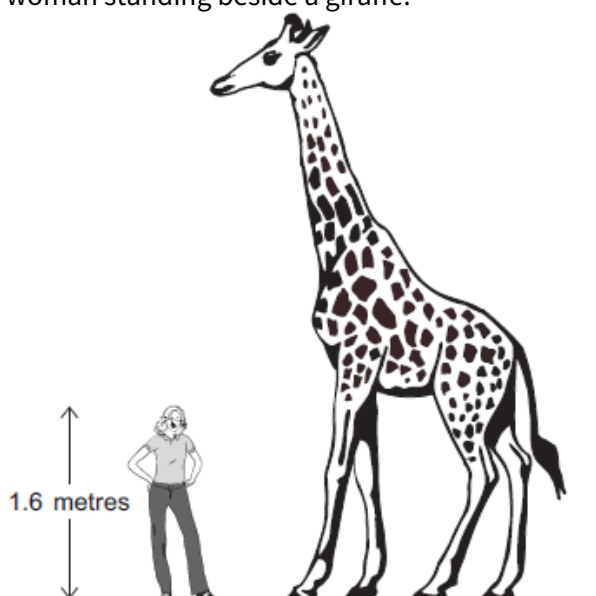
(Total 1 mark)

For the rest of the questions, you may use a calculator.



Q12.

The diagram shows a woman standing beside a giraffe.



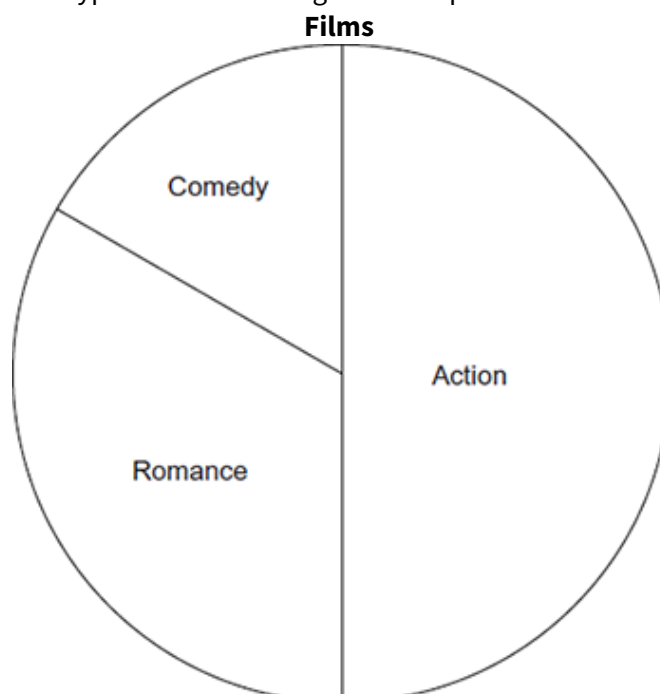
Estimate, in metres, the height of the giraffe.
You **must** show your working.

(Total 2 marks)

Q13.

You will need a protractor to answer this question.

The pie chart shows the types of film showing at a multiplex cinema.



There are 3 comedy films.

(a) How many films are showing altogether?

(3)

(b) How many **more** romance films are showing than comedy films?

(2)

(Total 5 marks)

Q14.

The rectangle is drawn accurately.

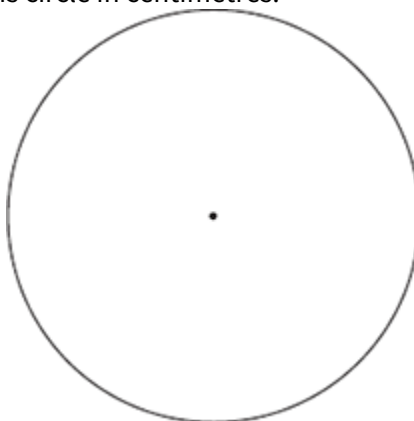


Work out the perimeter of the rectangle.

(Total 3 marks)

Q15.

(a) Measure the radius of this circle in centimetres.



(1)

(b) Measure or work out the diameter of the circle in centimetres.

(1)

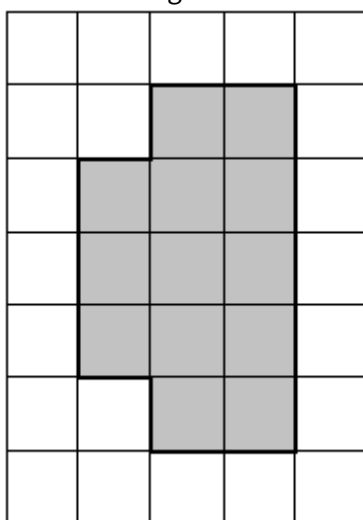
(c) Write down a formula in words connecting the diameter and the radius.

(1)

(Total 3 marks)

Q16.

Work out the shaded area on the centimetre grid.



State the units of your answer.

(Total 3 marks)

Q17.

Write down a suitable **unit** of mass for an apple.

(Total 1 mark)

Q18.

Circle the most suitable measurement for each of the following.

The amount an apple weighs.

1 gram 10 grams 100 grams

The amount of water in a full kettle.

2 litres 20 litres 200 litres

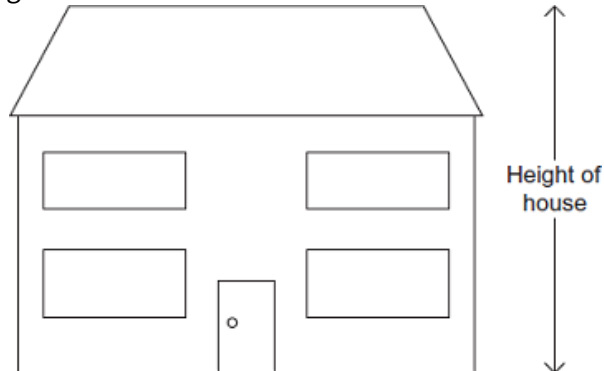
The height of a bus.

5 metres 50 metres 500 metres

(Total 3 marks)

Q19.

Here is a scale drawing of the front of a house.



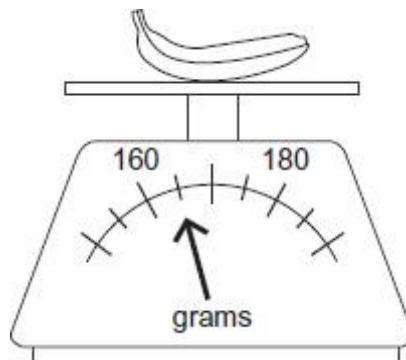
The actual height of the door is 2 metres.

Work out the actual height of the house.

(Total 3 marks)

Q20.

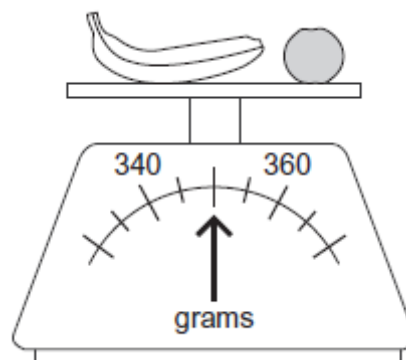
A banana is weighed.



(a) How much does the banana weigh?

(1)

(b) The banana is now weighed with an orange.



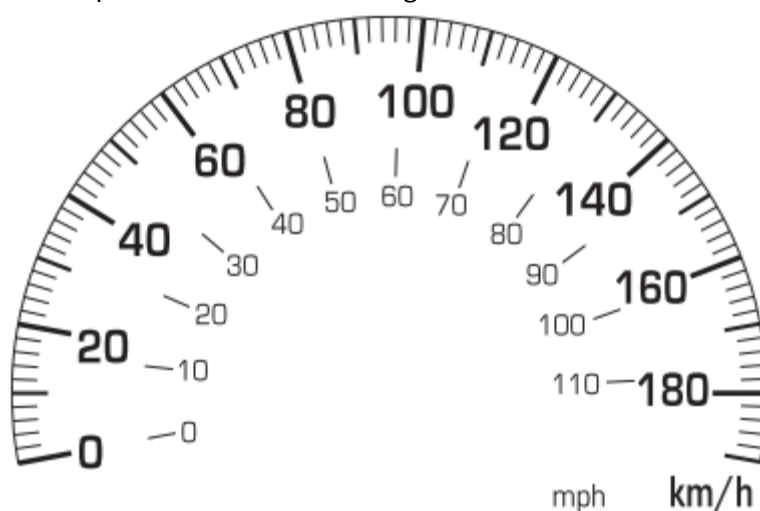
How much does the orange weigh?

(2)

(Total 3 marks)

Q21.

The diagram shows a speedometer on a car bought in France.



- (a) The speed limit on a road in France is 110 kilometres per hour (km/h).
Use the speedometer to estimate this speed in miles per hour (mph).

(1)

- (b) The speed limit on a road in England is 30 mph.
Use the speedometer to estimate this speed in km/h.

(1)

- (c) Marie has 56 litres of diesel in her car.
The car uses 1 litre of diesel for every 19 kilometres travelled.
She wants to drive to Paris, a distance of 1100 kilometres.
Does she have enough diesel for the journey?

(3)

(Total 5 marks)

Q22.

Circle the smaller measurement in each pair.

- (a) 5 centimetres 40 millimetres

(1)

- (b) 5 grams 40 kilograms

(1)

- (c) 5 litres 40 centilitres

(1)

(Total 3 marks)

Q23.

Complete each statement using the correct unit.

Choose from

tonnes kilograms grams litres millilitres

- (a) A boy weighs 45 _____

(1)

- (b) A packet of crisps weighs 28 _____

(1)

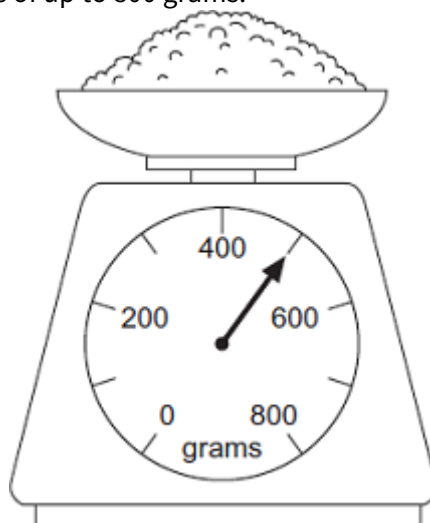
- (c) The volume of water in a full bottle is 2 _____

(1)

(Total 3 marks)

Q24.

These scales weigh amounts of up to 800 grams.



(a) What is the weight shown by the arrow?

(1)

(b) How can the scales be used to weigh 1.2 kilograms of flour?

(2)

(Total 3 marks)

Q25.

Circle the most suitable unit for each of the following.

The length of a human finger centimetres metres kilometres

The amount of water in a bath millilitres centilitres litres

The weight of a pencil grams kilograms tonnes

(Total 3 marks)

Q26.

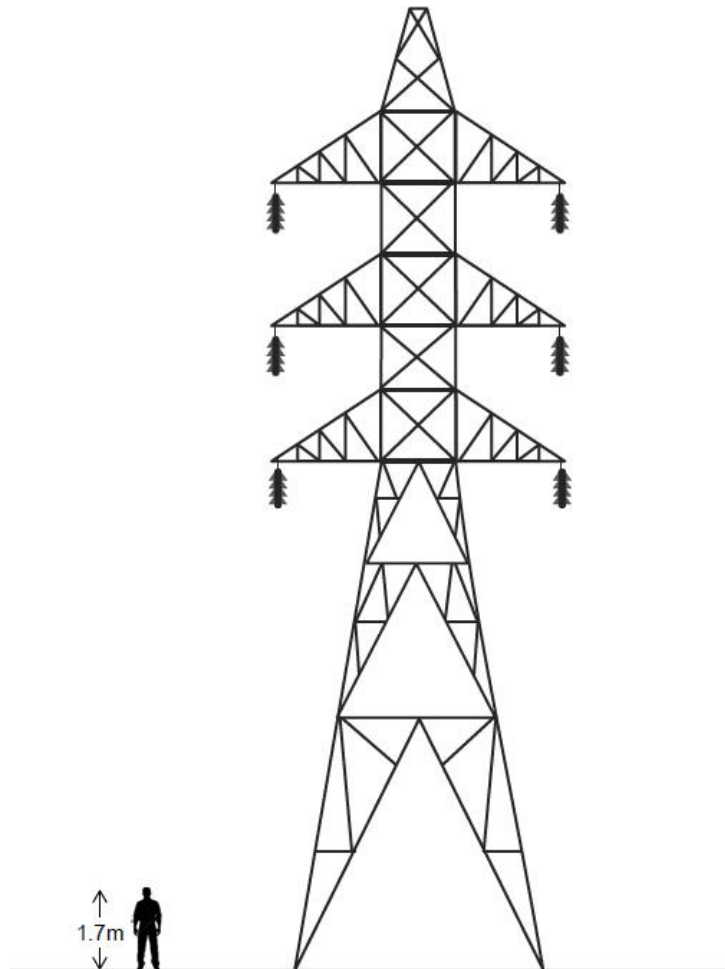


Work out the volume of the cuboid.

State the units of your answer.

(Total 3 marks)

Q27.

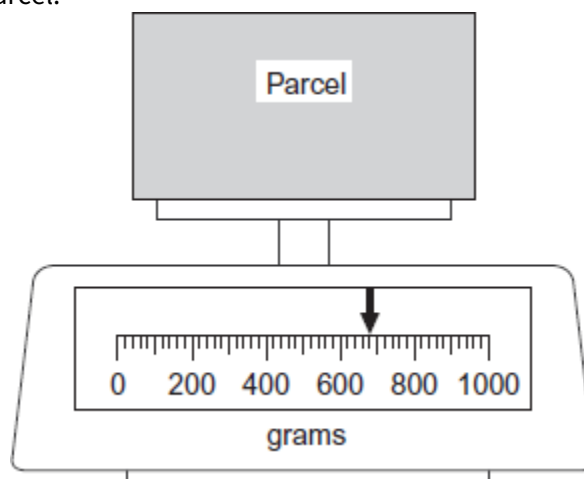


Use the height of the man to estimate the height of the pylon.

(Total 2 marks)

Q28.

(a) Amir weighs a parcel.



What is the weight of his parcel?

(1)

(b) Beth has a parcel that weighs 1600 grams.
What is 1600 grams in kilograms?

(1)

(Total 2 marks)

Q29.

Jody's pay is £315 per week.

She works for $37\frac{1}{2}$ hours per week.

(a) Work out her **hourly** rate of pay.

(2)

(b) Jody wants to work out her **yearly** pay.

She says,

“There are 4 weeks in a month, so I will multiply £315 by 4

There are 12 months in a year, so I will multiply the answer by 12

$£315 \times 4 \times 12 = £15\ 120$ ”

Does her method give the correct amount for her yearly pay?

Tick a box

☐

No, her yearly
pay is more

☐

Yes

☐

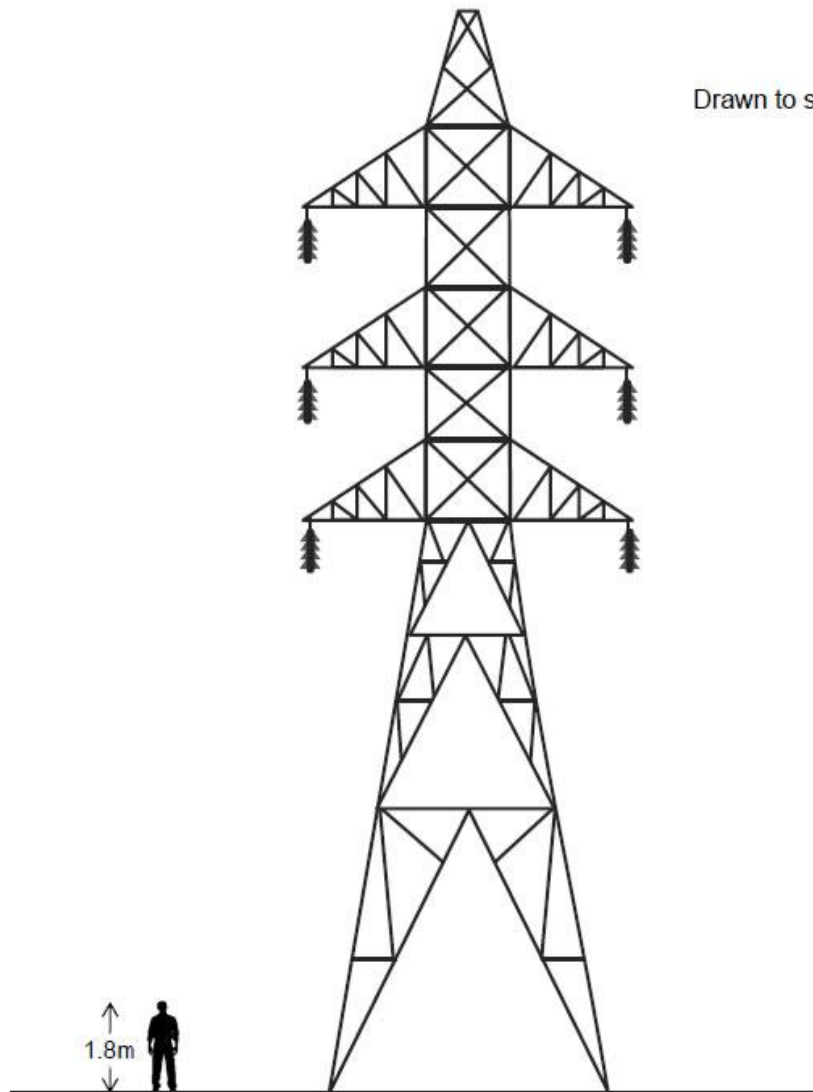
No, her yearly
pay is less

Show working to support your answer.

(2)

(Total 4 marks)

Q30.



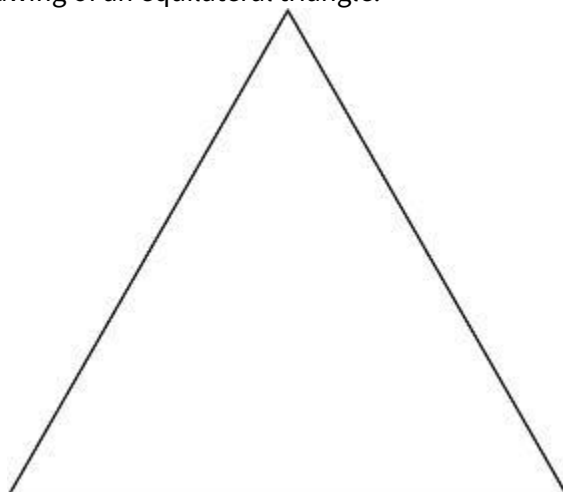
Use the height of the man to estimate the height of the pylon.

(Total 2 marks)

Q31.

Use a ruler for this question.

Here is an **accurate** drawing of an equilateral triangle.



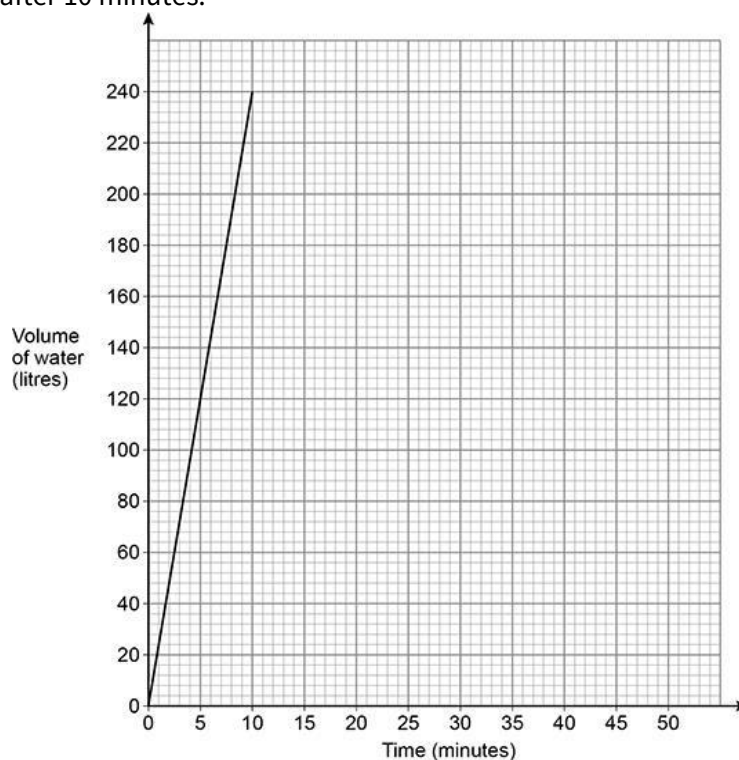
By measuring, work out the perimeter of the triangle.
State the units of your answer.

(Total 3 marks)

Q32.

The graph represents the volume of water in a bath.

The bath is full after 10 minutes.



- (a) Work out the rate at which the bath is filled.

State the units of your answer.

(2)

- (b) After the bath is full,
the volume of water stays constant for 20 minutes
then
all the water empties out at a constant rate in 12 minutes.
Show this information on the graph.

(2)

(Total 4 marks)