

TEST 5
CALCULATORS ALLOWED

WRITE YOUR ANSWERS, **INCLUDING ROUGH WORKING**, ON THESE SHEETS

1. Write down the next two terms of the following sequence

25, 22, 17, 10,,

2. a) Simplify $4x - 2y - x + 7y$.

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b) Expand $6(x - 2)$.

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c) Find the value of $5c - 4d$ when $c = -2$ and $d = 5$.

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3. Forty people were asked how many clocks they owned. The results were as follows.

Number of clocks owned	0	1	2	3	4	5
Number of people	3	6	10	15	4	2

a) What is the probability that a randomly chosen person from this group has exactly 1 clock?

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b) How many clocks have these people got altogether?

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4. The Smith family go on holiday to Mallorca, when the exchange rate is $\text{£}1 = 286$ pesetas.

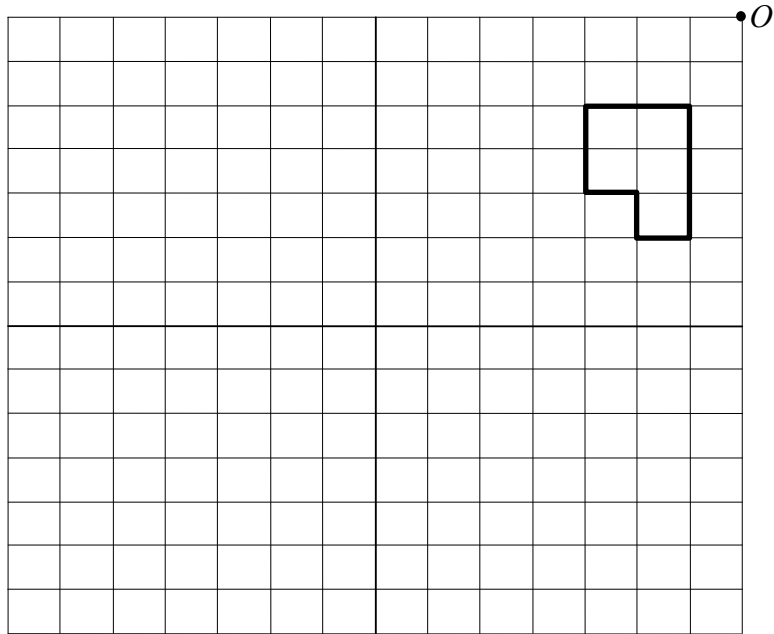
a) They exchange $\text{£}450$ into pesetas. How many pesetas did they get?

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b) Whilst on holiday they bought 20 postcards at 65 pesetas each and stamps for the postcards at 50 pesetas each. Calculate how much in £s , correct to the nearest penny, this cost them.

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5. Draw on the grid below, an enlargement of the given shape, using a scale factor of 2 and centre O .



6. A water tank in the shape of a cuboid, contains $60\,000\text{ cm}^3$ of water. The base of the tank measures 65 cm by 74 cm .

a) Calculate the depth, in cm, of the water in the tank.

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b) Given that $1\text{ gallon} = 4.54\text{ litres}$, calculate the number of gallons of water in the tank.

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7. Mr. Bones' gas bill for the period April 1st – June 30th is calculated from the following information.

Number of units used	211
Charge per unit	43.8p
Number of days in this period	91
Service charge per day	13.39p
VAT	5%

Showing all your working, find the total cost of the gas including VAT.

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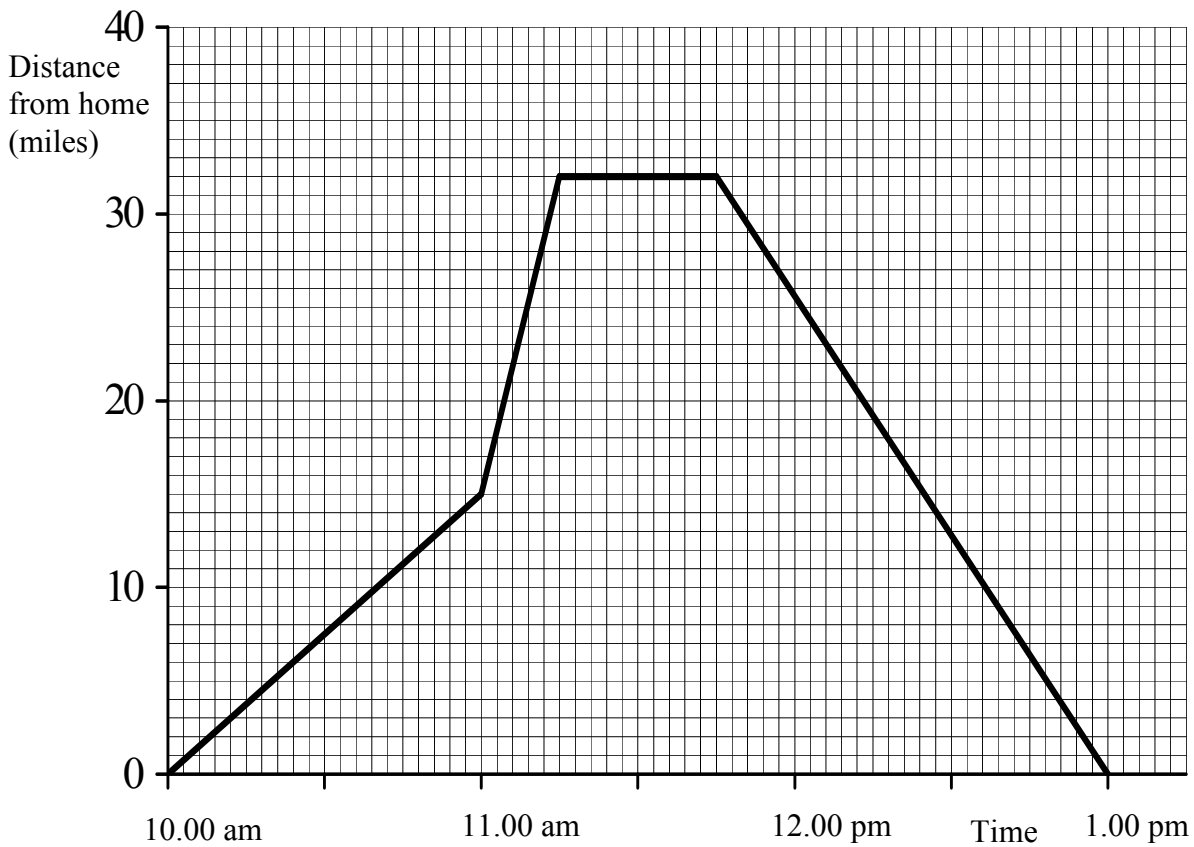
£33 plus
VAT at
 $17\frac{1}{2}\%$

£40
including
VAT

Which price offer is the cheaper and by how much?

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9. The graph below shows Gary's journey by car from his home to a services area, where he stops for a while before returning home.



a) How far is the services area from Gary's home?

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b) How long did Gary stop at the services area?

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c) Use the graph to find Gary's average speed, in m.p.h., for his return journey home.

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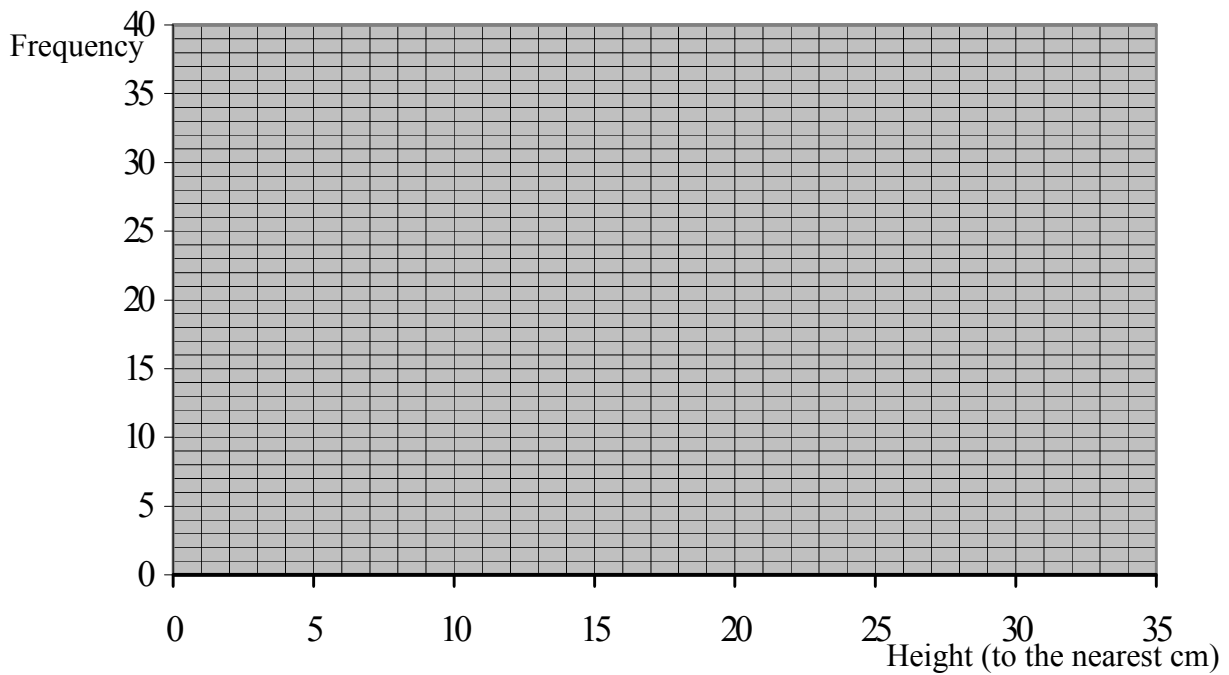
10. A biologist measures the heights of 120 shrubs to the nearest cm. The following table shows her results.

Height (to nearest cm)	1 to 5	6 to 10	11 to 15	16 to 20	21 to 30
Frequency	12	25	24	39	20

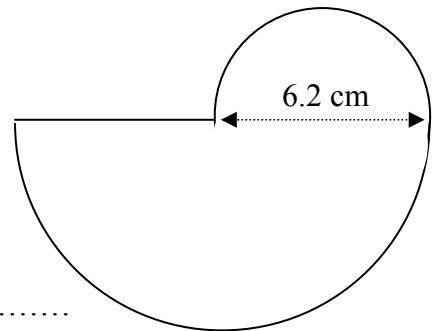
- a) Write down the modal class.

- b) Calculate an estimate of the mean height of the shrubs in the sample.

- c) Draw a grouped frequency diagram to show the biologist's results.



11. The shape shown below is made up of two semicircles. The diameter of the smaller semicircle is 6.2 cm. C is the mid-point of the diameter of the larger semicircle.



- Stating clearly the units of your answers, calculate
- a) the perimeter of the shape.

b) Find, in standard form, the value of:

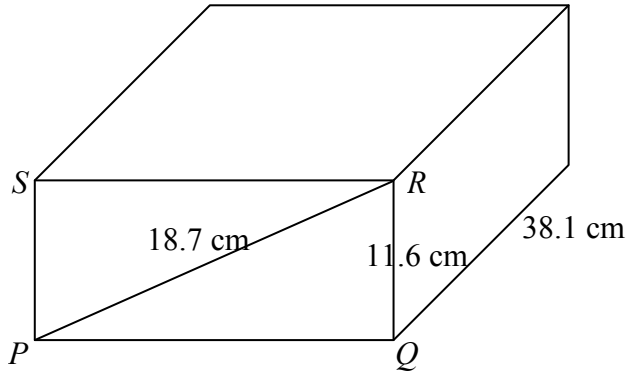
i) $(3.5 \times 10^6) \times (8.2 \times 10^4)$

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ii) $(8.2 \times 10^{-7}) \div (2.3 \times 10^4)$

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16.



The diagram shows a cuboid of length 38.1 cm. The cross-section, $PQRS$, is such that $PR = 18.7$ cm and $QR = 11.6$ cm.

a) Calculate the length of PQ .

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b) The density of the material from which the cuboid is made is 3.2 g/cm^3 . Calculate the mass of the cuboid in kilograms.

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17. A solution to the equation $x^3 - 5x + 1 = 0$ lies between 2.1 and 2.2. Use the method of trial and improvement to find this solution correct to 2 decimal places.

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18. a) Simplify $(3x^2)^3$.

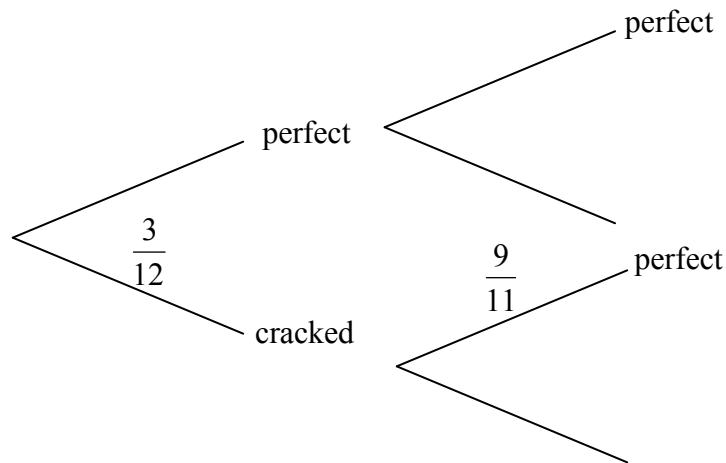
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b) Make d the subject of the following formula. $3(d - 3e) = 10 + 4e$.

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19. There are 3 cracked eggs and 9 perfect eggs in a box. Finbar chooses 2 eggs at random from this box.

a) Complete the tree diagram to show all the possible outcomes.



b) Calculate the probability that both eggs are cracked.

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c) Calculate the probability that at least one of the chosen eggs is cracked.

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Answers.

1. 1, -10.
2. a) $3x + 5y$ b) $6x - 12$ c) -30.
3. a) $\frac{3}{20}$ b) 97.
4. a) 128700 pesetas b) £8.04.
6. a) 12.47401247 cm b) 13.21585903 gallons.
7. £109.83.
8. The first costs £38.78 and so is the cheaper by £1.22.
9. a) 32 miles b) 30 minutes c) 25.6 m.p.h.
10. a) 16 to 20 cm b) 14.833333... cm c) bar-chart drawn.
11. a) 35.41681168 cm b) 75.4767635 cm^2 .
12. April 20th = £270, April 28th = £274.05, May 20th = £246.65, May 28th = £250.35.
13. a) $2x^3 + 8x^2$ b) $18x - 11$.
14. 0.15.
15. a) i) 520000 ii) 0.0036
b) i) 2.87×10^{11} ii) $3.565217391 \times 10^{-11}$.
16. a) 14.66731059 cm b) 20.74356669 kg.
17. $x = 2.13$ to 2 decimal places.
18. a) $27x^6$ b) $d = \frac{10 + 13e}{3}$.
19. b) $\frac{1}{22}$ c) $\frac{5}{11}$.
20. $x = -3$.