

ISEB Assessments

Year 8 Level 3 Maths Test 1

Author: ISEB



This test contains a selected set of 10 questions in a particular topic order.

- 100 marks are available in total.
- You should take no more than 1 hour to complete the test.
- Write your answers in the spaces provided.
- Always write down your working, except when you are told not to.
- Calculators are not allowed.

NOTE TO TEACHERS

This document may be reproduced free of charge for classroom use within the purchasing institution. Such copies are protected by copyright and may not be distributed or used in any way outside the purchasing institution.

Year 8 Level 3 Maths Test 1

1. (a) Find the sum of $\frac{1}{2}$, $\frac{2}{3}$ and $\frac{3}{4}$

Answer: (2)

(b) (i) Work out $10\frac{1}{2} \div 2\frac{2}{5}$

Answer: (3)

(ii) Wood is sold in $2\frac{2}{5}$ metre lengths.

I need $10\frac{1}{2}$ metres of wood for a set of shelves I am building.

How many lengths of wood do I need to buy?

Answer: lengths (1)

(c) I buy $1\frac{3}{4}$ kg of steak priced at £9.60 per kg.

How much do I pay?

Answer: £ (2)

(d) What is the average of $\frac{3}{5}$ and $\frac{5}{7}$?

Give your answer as a proper fraction.

Answer: (2)

Turn over to the next page for question 2

Year 8 Level 3 Maths Test 1

2. (a) Calculate $16 - 9 \div 3$

Answer: (1)

(b) Given that $32 \times 65 = 2080$ find

(i) 16×65

Answer: (1)

(ii) 160×0.65

Answer: (1)

(iii) $1040 \div 16$

Answer: (2)

(c) By writing each number correct to 1 significant figure, estimate the answer

to
$$\frac{3.95 \times 19.4}{9.8}$$

Answer: (2)

(d) Tommy has completed a calculation and his calculator display is shown below.



(i) Write the number in the display correct to two decimal places.

Answer: (1)

(ii) Write the number in the display correct to three significant figures.

Answer: (1)

(iii) Write the number in the display to the nearest 5

Answer: (1)

Turn over to the next page for question 3

3. The terms of a sequence are generated as follows:

T_1	=	$\frac{1}{2} \div \frac{2}{3}$	=	$\frac{1}{2} \times \frac{3}{2}$	=	$\frac{3}{4}$
T_2	=	$\frac{2}{3} \div \frac{3}{4}$	=	$\frac{2}{3} \times \frac{4}{3}$	=	$\frac{8}{9}$
T_3	=	$\frac{3}{4} \div \frac{4}{5}$	=	$\frac{3}{4} \times \frac{5}{4}$	=	$\frac{15}{16}$
T_4	=	$\frac{4}{5} \div \frac{5}{6}$	=	$\frac{4}{5} \times \frac{6}{5}$	=
T_5	=	$\frac{5}{6} \div \frac{6}{7}$	= \times	=
T_6	= \div	= \times	=

(i) Study the sequence and continue the pattern by filling in the blanks. (2)

(ii) If the numerator of the first fraction in the left-hand column is n , write expressions, in terms of n , for:

(a) the denominator of the first fraction in the left-hand column

Answer: (1)

(b) the denominator of the second fraction in the left-hand column

Answer: (1)

(c) the denominator of the fraction in the right-hand column

Answer: (1)

(d) the numerator of the fraction in the right-hand column.

Answer: (1)

(iii) Write a formula for T_n in terms of n .

There is no need to simplify the formula.

Answer: $T_n =$ (2)

(iv) Using your formula, or otherwise, find the 20th term of the sequence.

Answer: (2)

Year 8 Level 3 Maths Test 1

4. Two numbers are said to be **co-prime** if they have no common factor except 1

For example, 5 and 14 are co-prime, but 6 and 9 are not co-prime because 3 is a factor of both 6 and 9

(i) Consider whether the following pairs of numbers are co-prime or not co-prime.

If they are co-prime, write 'co-prime' in the answer.

If they are not co-prime, state a factor of both numbers.

(You may wish to write a set of prime factors for each number.)

(a) 12 and 28

Answer: (1)

(b) 15 and 28

Answer: (1)

(c) 220 and 441

Answer: (2)

(d) 330 and 273

Answer: (2)

- (ii) List the first 5 counting numbers which are **not** co-prime with 12

Answer: , , , , (2)

- (iii) Tommy writes the numbers 21 to 25 inclusive on separate cards.

He takes two cards at random.

What is the probability that the numbers on the two cards are co-prime?

Answer: (2)

Turn over to the next page for question 5

Year 8 Level 3 Maths Test 1

5. (a) Multiply out the brackets and simplify:

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

Answer: (2)

(ii) $x(2x - 1) + 2(x^2 - 3)$

Answer: (3)

(b) If $a = 4$, $b = -3$, $c = -1$ and $d = 5$, evaluate:

(i) $a + b$

Answer: (1)

(ii) c^2

Answer: (1)

(iii) $c^2 - 2d$

Answer: (1)

(iv) y , where $y = (a + b) \times (c^2 - 2d)$

Answer: (2)

6. (a) Here is a sequence of numbers:

3, 11, 19, 27, ...

Find:

(i) the next two terms

Answer:, (1)

(ii) the 20th term

Answer: (2)

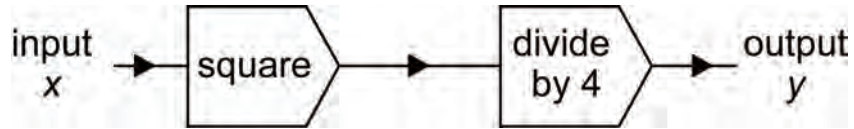
(iii) the n th term.

Answer: (2)

Turn over to the next page for question 6 (b)

Year 8 Level 3 Maths Test 1

(b) This function machine represents a quadratic function.



(i) Complete this table of input and output values.

input	→	output
x	→	y
-4	→	4
-3	→	
0	→	
2	→	1
3	→	$2\frac{1}{4}$
	→	$6\frac{1}{4}$

(1)

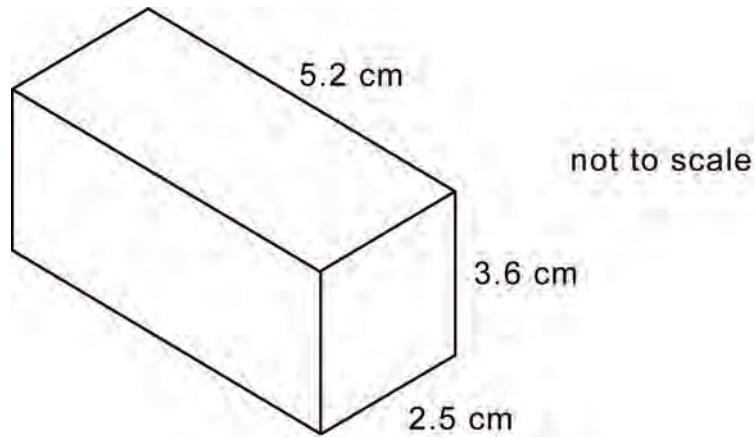
(1)

(2)

(ii) What is the equation of the line of symmetry of the curve representing this function?

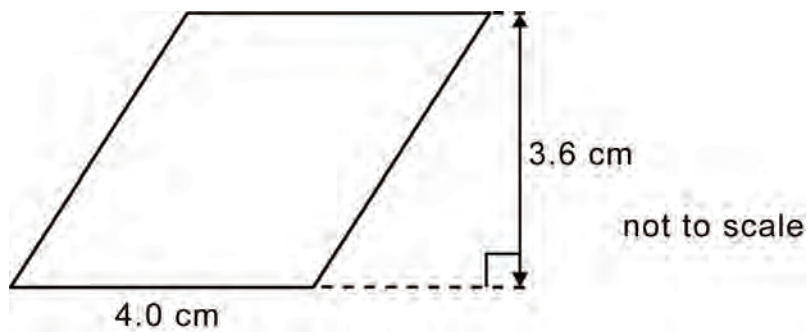
Answer: (1)

7. (a) (i) Calculate the volume of this cuboid.



Answer: cm³ (2)

(ii) Calculate the area of this parallelogram.

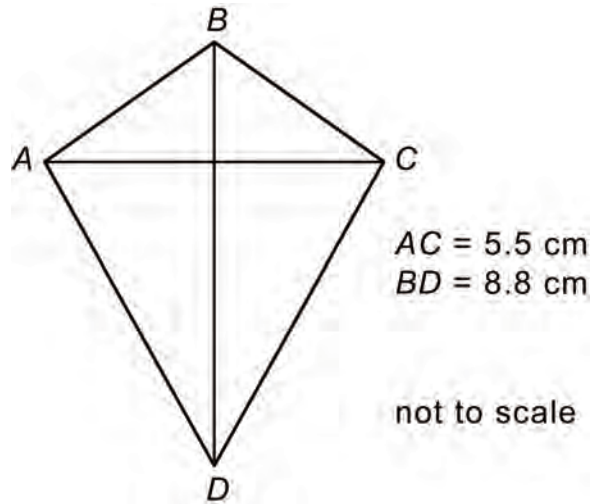


Answer: cm² (1)

Turn over to the next page for question 7 (a) (iii)

Year 8 Level 3 Maths Test 1

(iii) Calculate the area of this kite.



Answer: cm² (2)

(b) The size of each interior angle of a regular polygon is 140°.

(i) Find the size of an exterior angle of the polygon.

Answer: ° (1)

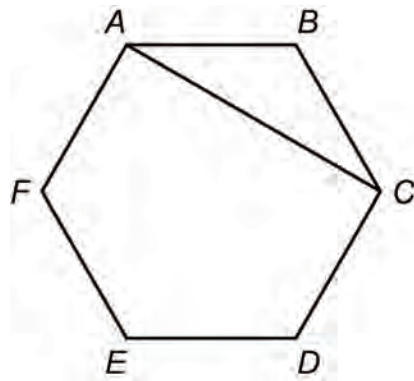
(ii) Find the number of sides of the polygon.

Answer: sides (1)

(iii) State the name of the polygon.

Answer: (1)

(c) In the diagram, $ABCDEF$ is a regular hexagon.



not to scale

Calculate the size of angle BAC .

Answer: ° (2)

Turn over to the next page for question 8

Year 8 Level 3 Maths Test 1

8. In this question take π to be $\frac{22}{7}$

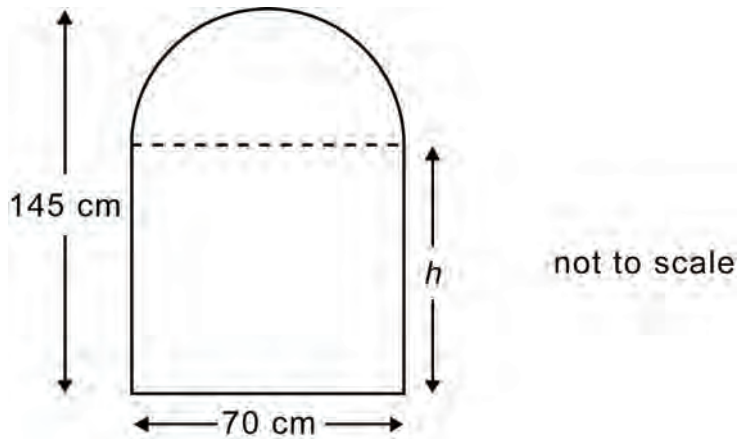
(i) (a) Find the circumference of a circle whose diameter is 70 cm.

Answer: cm (2)

(b) Find the area of a circle whose radius is 35 cm.

Answer: cm² (2)

(ii) A church window is made up of a rectangle at the bottom, with a semicircle at the top, as shown in the diagram below.



(a) What is the height, h , of the rectangular part of the window?

Answer: $h = \dots\dots\dots$ cm (1)

(b) Using your answer to part (i) (a), find the perimeter of the window.

Answer: $\dots\dots\dots$ cm (2)

(c) Using your answer to part (i) (b), find the area of the window.

Answer: $\dots\dots\dots$ cm² (2)

The glass is 5 mm thick.

(d) What is the approximate volume of the window?

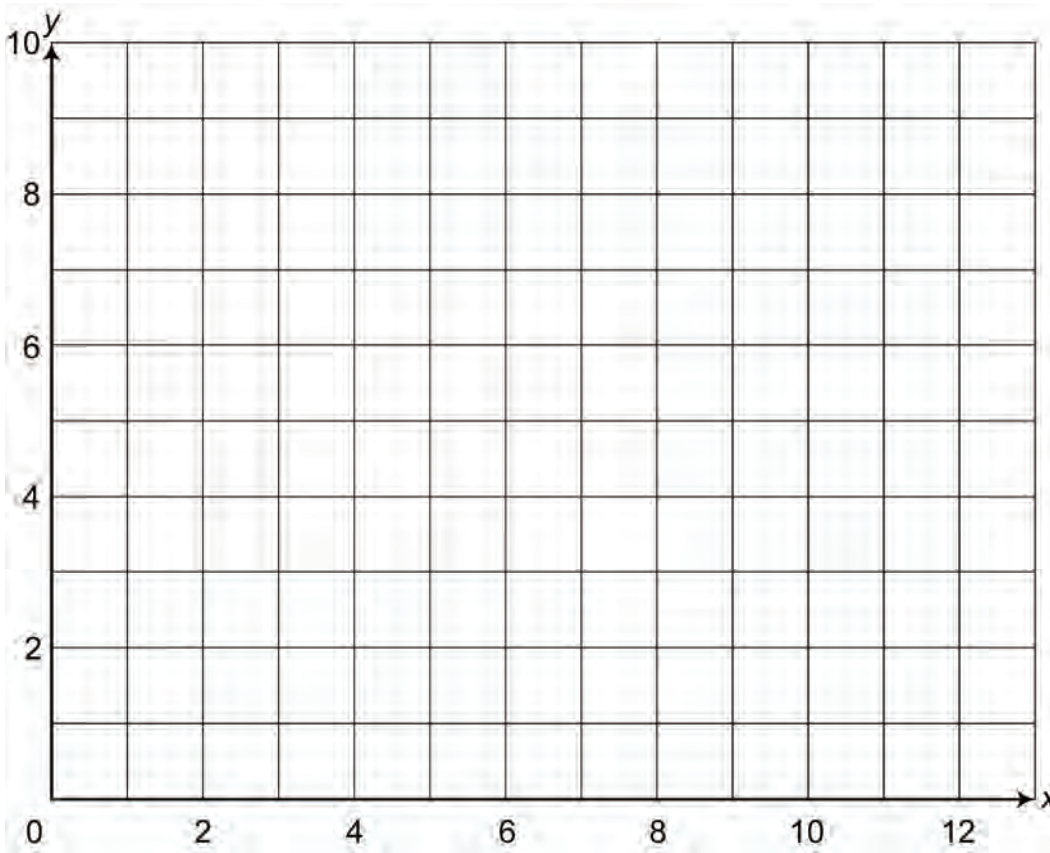
Answer: $\dots\dots\dots$ cm³ (1)

Year 8 Level 3 Maths Test 1

9. (i) On the grid below, plot the points $A(2, 2)$, $B(4, 2)$, $C(4, 3)$ and $D(2, 3)$.

Join the points in order to form the rectangle $ABCD$.

(2)



(ii) Using the point $(1, 1)$ as the centre of enlargement, enlarge the rectangle $ABCD$ with scale factor 3

(3)

(iii) What is the area of:

(a) the rectangle $ABCD$

Answer: cm^2 (1)

(b) the enlargement?

Answer: cm^2 (2)

- (iv) What is the ratio, in its simplest form, of the area of $ABCD$ to the area of the enlargement?

Answer: : (2)

Turn over to the next page for question 10

Year 8 Level 3 Maths Test 1

10. On a farm there are 240 animals.

There are 80 sheep and the same number of cows.

Four fifths of the rest are pigs and the remainder are goats.

(i) How many of the animals are:

(a) pigs

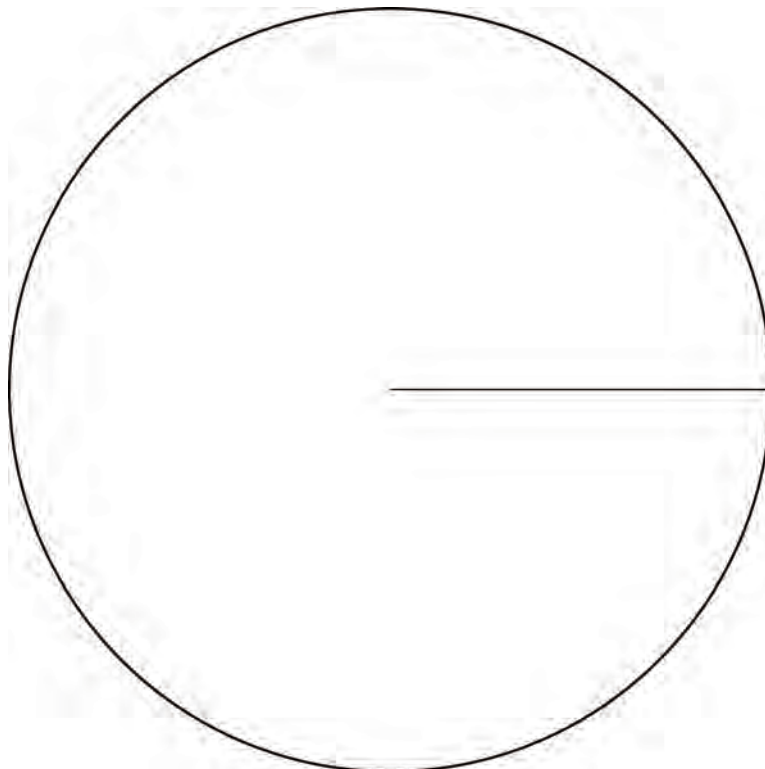
Answer: pigs (2)

(b) goats?

Answer: goats (1)

(ii) Construct a pie chart to show this information.

Write the size of the angle and the type of animal in each sector. (5)



(iii) If the farmer chooses an animal at random, what is the probability that it is:

(a) a pig

Answer: (1)

(b) not a cow?

Answer: (1)