Mid-Year Examination Specimen Paper 1

Marks Obtained
50

Duration: 1 hour

1 Express 89.5461 correct to

(a) 2 significant figures, [1]

(b) 1 decimal place. [1]

Answer: (a) _____

(b) _____

2 Express 12% as

(a) a decimal, [1]

(b) a fraction in its simplest form. [1]

Answer: (a) _____

(b) _____

3 Expand and simplify $3x - 4x(2x - 1)$. [2]

Answer: _____

4 Given that $n = 2\pi\sqrt{\frac{m}{g}}$, express m in terms of π, g and n. [2]

Answer: m = _____

5 Simplify each of the following:

(a) $\frac{4a^2b^5}{6b^3c^3}$ [1]

(b) $\frac{4}{2d+1} + \frac{1}{d-1}$ [2]

Answer: (a) _____

(b) _____

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6 Factorise completely the following equations:

(a) $3y - 12xy$ [1]

(b) $4z^2 - 25$ [2]

Answer: (a) _____

(b) _____

7 Solve the equation $4(m-1)^2 = 9m^2$. [3]

Answer: $m =$ _____ or _____

8 If m is inversely proportional to the square root of n, and $m = 4$ when $n = 9$, find

(a) an equation connecting m and n, [2]

(b) the value of n when $m = -6$. [1]

Answer: (a) _____

(b) $n =$ _____

9 Arrange the following numbers in descending order:

$$3.330, \quad \pi, \quad \sqrt{10}, \quad 3.\dot{3} \qquad [3]$$

Answer: _____, _____, _____, _____

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10 Two of the exterior angles of an n-sided polygon are 80º and 64º, and the remaining exterior angles are 36º. Find

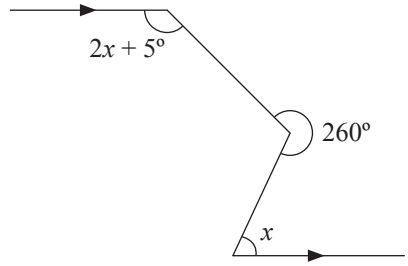
(a) the value of n, [2]

(b) the largest interior angle of the polygon. [1]

Answer: (a) n = _____

(b) _____º

11 Find the value of x in the figure. [3]



Answer: $x =$ _____ °

12 Solve the following simultaneous equations:

$$4x - 3y = 8$$
$$5y - 2x = -11$$ [4]

Answer: $x =$ _____ , $y =$ _____

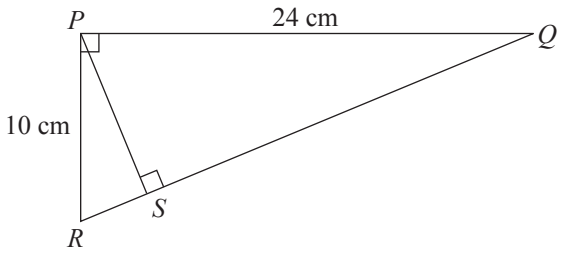
13 In the figure, PQR is a right-angled triangle and RSQ is a straight line. $PR = 10$ cm, $PQ = 24$ cm, $\angle QPR = \angle PSQ = 90°$ and $RS : SQ = 3 : 10$.

Calculate the length of

(a) (i) QR, [1]

(ii) PS. [2]

(b) Find $\cos \angle PQR$. [1]



Answer: (a) (i) $QR =$ _____ cm

(ii) $PS =$ _____ cm

(b) $\cos \angle PQR =$ _____

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14 (a) Express 60 and 75 in index notation. [2]

(b) Find the least value of n such that $60n$ is a multiple of 75. [2]

Answer: (a) $60 =$ _____

$75 =$ _____

(b) $n =$ _____

15 Write down the next two terms of the following sequences:

(a) 1, $\sqrt{2}$, $\sqrt{3}$, 2, _____, _____ [2]

(b) 2, $1\frac{1}{2}$, $1\frac{1}{3}$, $1\frac{1}{4}$, _____, _____ [2]

Answer: (a) _____ , _____

(b) _____ , _____

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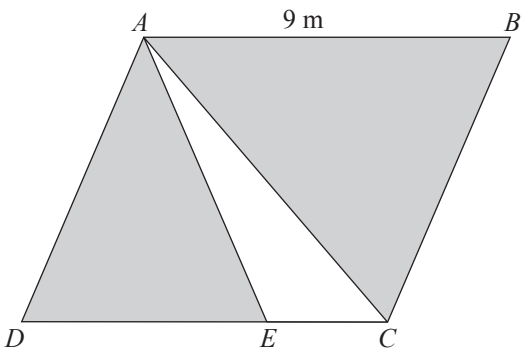
16 In the figure, $ABCD$ is a parallelogram and AED is a triangle. Given that $AB = 9$ m, $DE = 2EC$ and the area of $ABCE$ is 63 m^2, calculate

(a) the area of $\triangle AEC$, [3]

(b) the fraction of the shaded region in the parallelogram. [2]



Answer: (a) _____ m^2

(b) _____

Mid-Year Examination Specimen Paper 2

PART I (40 marks)
Duration: 1 hour

Marks Obtained
50

1 A mixture contains liquids X, Y and Z in the ratio $2 : y : 5$. There is 240 ml less liquid X than liquid Z and there is 560 ml more liquid Y than liquid X.

(a) Calculate the value of y. [2]

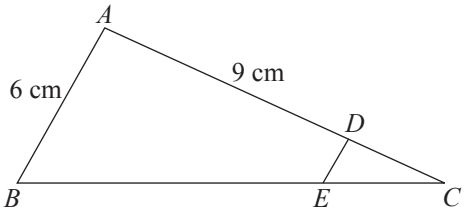
(b) How much liquid X need to be added so that the mixture will contain 30% of liquid Y? [3]

2 The diagram shows two similar triangles, ABC and DEC. $AB = 6$ cm, $BC = 3EC$ and $AD = 9$ cm. Given that $\triangle DEC$ has an area of 8 cm^2, calculate

(a) the length of DE, [1]

(b) the length of DC, [2]

(c) the area of the quadrilateral $ABED$. [2]



3 Solve the simultaneous equations: [4]

$$2x + 5y = 6$$
$$4x - y = 1$$

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4 (a) Given that $p^2 + q^2 = 75$ and $pq = 35$, find the value of $(p - q)^2$. [2]

(b) Given that $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$, find the value of v when $u = 3$ and $f = \frac{7}{12}$. [2]

(c) Evaluate the following:

(i) $\frac{4.10^2}{\sqrt{0.0219}}$ [1]

(ii) $\frac{\sqrt[3]{8.17} + 29.4}{5200 \times 61.7}$ [2]

Leave your answers, correct to three significant figures, in ***standard form***.

5 A river of 9.6 km long has a length of 24 mm on a map.

(a) Express the scale drawing of the river in the form $1 : n$. [1]

(b) On the map, a tunnel has a length of 4.2 cm. Calculate, in km, its actual length. [2]

(c) A plantation has an area of 25 cm^2 on the map. What will be its area drawn on another map whose scale is 1 : 80 000? [3]

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6 Solve each of the following equations:

(a) $4(x - 1)^2 = 25$ [2]

(b) $y(y - 1) + 4y = 10$ [3]

(c) $\frac{2}{z + 3} - \frac{1}{z} = 0$ [2]

7 A dozen of pen cost $19.10 more than five erasers. Judith spends $120.50 to buy 5 dozens of pens and 25 erasers.

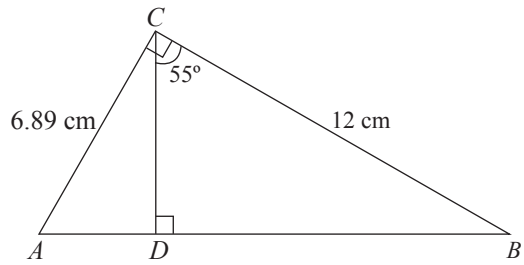
(a) Find the cost of
  (i) a pen,
  (ii) an eraser. [4]

(b) If Judith spends the same amount of money to buy pens only, how many pens, at most, can she buy? [2]

PART II (10 marks)

EITHER

In the diagram, ADB is a straight line, $\angle ACB$ and $\angle CDB$ are right angles. $\angle DCB = 55°$, $AC = 6.89$ cm and $CB = 12$ cm.



(a) Write down ***two*** pairs of triangles that are similar to $\triangle ABC$. [2]

(b) Find

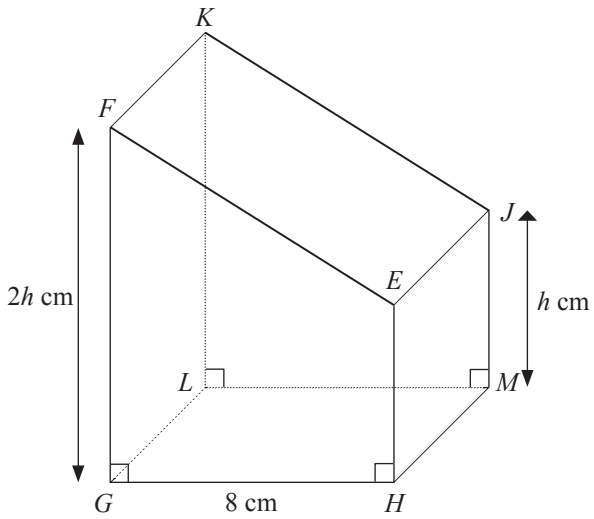
(i) $\angle CAD$, [1]

(ii) the length of AB, [2]

(iii) the area of $\triangle CBD$. [3]

(c) Find the shortest distance from the point D to the line CB. [2]

OR



In the diagram, *EFGH* and *JKLM* are two identical trapeziums where $FG = 2EH$ and $GH = 8$ cm. *GHML* is a square base.

(a) Find the area of the trapezium *EFGH* in terms of h. [2]

The volume of the prism is $12(3h^2 - 35)$ cm^3.

(b) Show that $3h^2 - 8h - 35 = 0$. [3]

(c) Solve for the value of h. [3]

(d) Hence, find the area of the rectangle *EFKJ*. [2]