1. (a) Find the value for each of the following:

(i) $\left(\frac{25}{64}\right)^{\frac{1}{2}}$ (ii) $64^{\frac{2}{3}}$ (iii) 3^{-3}

(6 marks)

(b) Simplify the following expressions.

(i) $4x^{\frac{1}{3}}y^{-4} \times 7x^{1\frac{2}{3}}y^{6}$ (ii) $15a^{4} \div 3a^{-2}$

(5 marks)

(iii) $\sqrt[4]{16x^{8}y^{4}}$

(3 marks)

(c) Simplify the expression and write your answer with positive indices.

$3(x^{-3}y^{4})^{-2}$

(3 marks)

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(d) Solve each of the following equations.

(i) $9^x = 27$

(3 marks)

(ii) $5^{2x} \times 125 = \frac{1}{5^{3x}}$

(4 marks)

Total of 24 marks

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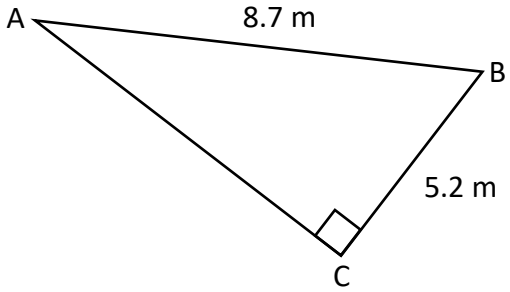
2.



(a) In the diagram above, **not drawn to scale**, shows triangle ABC with AB = 8.7 m and CD = 5.2 m, AE = 6 m. Calculate length of AC correct to 2 decimal places.

(3 marks)

(b) Jayla runs a string of lights from the ground straight up a door frame that is 2.5 metres tall. She then runs the rest of the string in a straight line to a point on the ground that is 6 metres from the base of the door frame.

(i) Draw a diagram to represent the information given above.

(2 marks)

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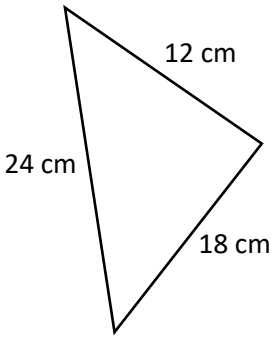
(ii) Calculate the total length of the string.

(3 marks)

(iii) If there are 10 lights per metre on the string, how many lights in total are on the string?

(2 marks)

(c) Using Pythagoras theorem, determine whether the given triangle is right angle.



(4 marks)

Total of 14 marks

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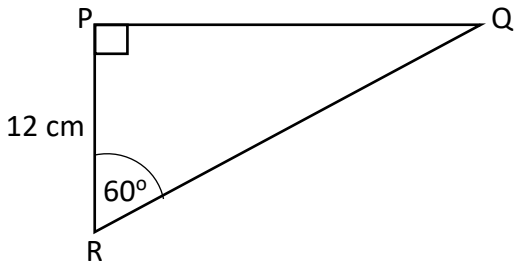
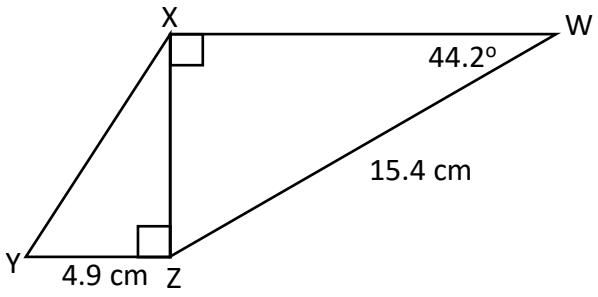
3.



(a) In the diagram above, **not drawn to scale**, shows triangle RPQ with PR = 12 cm and angle PRQ = 60°. Calculate the length of QR, in cm.

(4 marks)

(b) In the diagram below, **not drawn to scale**, angle XZY = angle WXZ = 90°, angle XWZ = 44.2°, YZ = 4.9 cm and WZ = 15.4 cm



(i) Calculate the length of XZ correct to **THREE** significant figures.

(4 marks)

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(ii) Calculate the size of angle XYZ correct to 1 decimal place.

(4 marks)

Total of 12 marks

4. A circle has an area of 452.16 cm^2. Use $\pi = 3.14$.

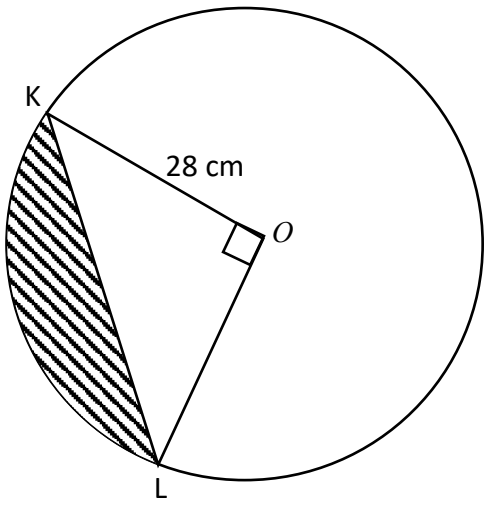
(a) (i) Calculate the radius of the circle, in cm.

(3 marks)

(ii) Calculate the circumference of the circle correct to **THREE** significant figures.

(3 marks)

(b) In the diagram below**, not drawn to scale**, shows a circle with centre *O* and a radius of 28 cm.



Use $\pi = \frac{22}{7}$

(i) Calculate the area of the minor sector K*O*L.

(3 marks)

(ii) Calculate the area of the shaded region.

(4 marks)

Total of 13 marks

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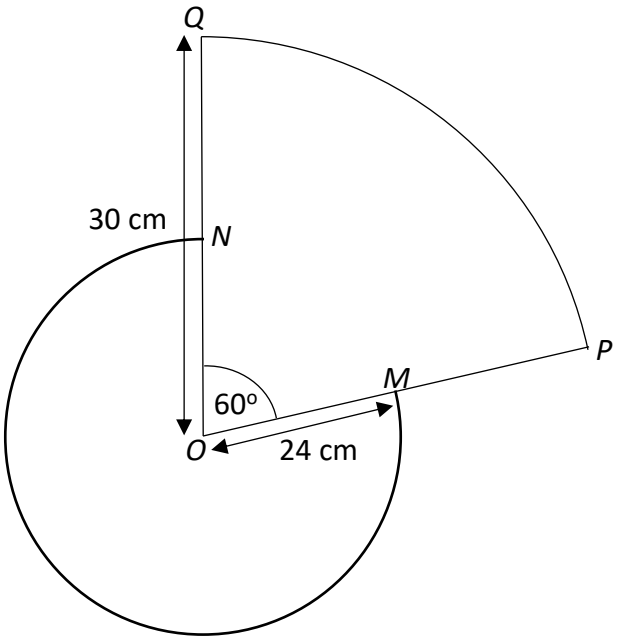
5.



The diagram above, **not drawn to scale**, shows two sectors with centre *O*. The minor sector *OPQ* has a radius of 30 cm and sector angle of 60° and the major sector *OMN* has a radius of 24 cm. Use $\pi = 3.14$.

(a) Calculate the area of the minor sector *OPQ*.

(3 marks)

(b) Determine the size of the angle in the major sector *OMN*.

(1 mark)

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(c) Calculate the area of the major sector *OMN* correct to the **NEAREST** whole number.

(3 marks)

(d) Calculate the length of the minor arc *PQ* correct to 1 decimal place.

(3 marks)

(e) Calculate the perimeter of the shape correct to 1 decimal place.

(5 marks)

Total of 15 marks

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6. (a) Simplify

(i) $\frac{2x+3}{4} - \frac{x-5}{8}$

(4 marks)

(ii) $\frac{6x-7}{4} + \frac{3x+2}{5}$

(4 marks)

(b) Solve the equations for x

(i) $\frac{1-3x}{5} + \frac{2x-2}{4} = -1$

(5 marks)

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(ii) $\frac{1-x}{3} = \frac{4x+2}{7}$

(3 marks)

Total of 16 marks

END OF EXAM

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THE TEST.