TRIGONOMETRY - CHAPTER REVIEW

1 Simplify:

(a) $\cos(90° - \theta)$ **(b)** $\sin(270° - \theta)$ **(c)** $\cos(90° + \theta)$

(d) $\tan(\theta - 180°)$ **(e)** $\tan(180° - \theta)$ **(f)** $\sin(\theta + 180°)$

2 Write the exact value.

(a) $\tan 315°$ **(b)** $\sin 225°$ **(c)** $\cos 180°$

(d) $\tan 360°$ **(e)** $\sin 60°$ **(f)** $\cos 210°$

3 Simplify:

(a) $\dfrac{\cos\theta}{\sin(90° - \theta)}$ **(b)** $\cos(90° + \theta) + \sin\theta$

4 If $\tan\theta = \frac{3}{5}$ and $180° < \theta < 270°$, write the exact value of: **(a)** $\sin\theta$ **(b)** $\cos\theta$

5 If $\sin\alpha = 0.6$ and $0° < \alpha < 90°$, write the exact value of:

(a) $\sin(180° - \alpha)$ **(b)** $\cos(90° - \alpha)$ **(c)** $\cos(180° + \alpha)$

(d) $\tan\alpha$ **(e)** $\tan(180° - \alpha)$ **(f)** $\sin(360° - \alpha)$

6 If $\tan\theta = t$, express in terms of t:

(a) $\tan(90° - \theta)$ **(b)** $\tan(180° + \theta)$ **(c)** $\cot(180° - \theta)$

(d) $\tan(360° - \theta)$ **(e)** $\tan(-\theta)$ **(f)** $\tan(90° + \theta)$

7 Calculate the cosine of the smallest angle of the triangle with side lengths 5 cm, 6 cm and 7 cm.

8 Find the size of the largest angle of the triangle with side lengths 5 cm, 6 cm and 8 cm. Hence, show that the triangle is obtuse-angled.

9 In ΔABC, $B = 53°$, $C = 48°$, $AC = 8$ cm. Calculate:

(a) the length of BC **(b)** the area of ΔABC.

10 A ladder 8 m long rests against a wall and its foot makes an angle of 60° with the horizontal ground. The top of the ladder then slips down the wall until its foot makes an angle of 45° with the ground. Find, in simplest surd form, how far down the wall the ladder slips.

11 From a point A, level with the foot of a vertical pole and 30 m from it, the angle of elevation of the top of the pole is 40°. Calculate:

(a) the height of the pole **(b)** the direct distance from A to the top of the pole

(c) the angle of elevation from A of a point half-way up the pole.

12 AB and CD are two vertical buildings with their bases at A and at C on horizontal ground. The height of AB is 30 m. The angle of elevation of B as seen from C is 25° and the angle of elevation of D as seen from A is 40°. Calculate:

(a) the horizontal distance between the buildings **(b)** the height of CD

(c) the angle of depression of B as seen from D.

13 Two yachts sail in a straight line from a buoy B. One sails 10 km in the direction 040° and the other sails 20 km in the direction 160°.

(a) How far apart are the yachts?

(b) What is the bearing of the first yacht as seen from the second yacht?

14 **(a)** Find a simplified expression for r given that $r^2 = (100 - 50t)^2 + (80t)^2 - 4(100 - 50t) \times 80t \times \cos 60°$.

(b) Find the value of r to the nearest whole number when $t = \frac{30}{43}$.

15 The elevation of a hill at a place K due east of the hill is 38°; at a place L, due south of K, the elevation of the hill is 26°. If the distance from K to L is 500 metres, calculate the height of the hill to the nearest metre.