

## 3.2 Sine, Cosine, and Tangent

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 9 marks

### Objective

Build the skills to answer exam questions on **sine, cosine, and tangent**.

**You must be able to:**

- use the right-triangle ratios **SOH-CAH-TOA**
- relate  $\tan \theta$  to  $\sin \theta$  and  $\cos \theta$

### 1 Worked examples

Study these first. Each one shows the method for a question type used later.

#### ■ Right-triangle ratios

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}, \quad \cos \theta = \frac{\text{adj}}{\text{hyp}}, \quad \tan \theta = \frac{\text{opp}}{\text{adj}}.$$

Also  $\tan \theta = \frac{\sin \theta}{\cos \theta}.$

#### ■ Example

A 3-4-5 right triangle (opp 3, adj 4, hyp 5):  $\sin \theta = \frac{3}{5}$ ,  $\cos \theta = \frac{4}{5}$ ,  $\tan \theta = \frac{3}{4}$ .

### 2 Practice

**2.1** State  $\sin \theta$  in terms of the triangle sides. [1]

**2.2** State  $\tan \theta$  as a ratio of sin and cos. [1]

**2.3** A right triangle has opp 3, adj 4, hyp 5. Find  $\sin \theta$  and  $\cos \theta$ . [2]

### 3 Exam-style questions

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**3.1**  $\cos \theta$  equals [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A** opp/hyp  
**B** adj/hyp  
**C** opp/adj  
**D** hyp/adj

**3.2**  $\tan \theta$  equals [1]

- |   |   |
|---|---|
| A | B |
| C | D |
- A**  $\sin \theta \cdot \cos \theta$   
**B**  $\sin \theta / \cos \theta$   
**C**  $\cos \theta / \sin \theta$   
**D**  $1 / \sin \theta$

**3.3** A right triangle has opp 5, adj 12, hyp 13.

- (a) Find  $\sin \theta$ . [1]  
(b) Find  $\cos \theta$ . [1]  
(c) Find  $\tan \theta$ . [1]