

Math

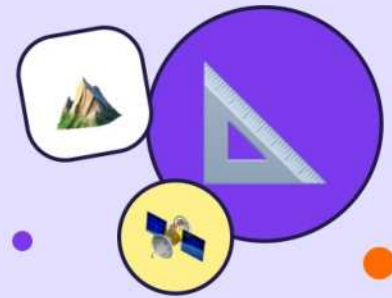
Grade 10

# Trigonometry in right triangles

Use sine, cosine and tangent to find sides and angles.



I can choose and use sin, cos and tan.



1



## Match up

Draw a line to match each pair.

☐ $\sin \theta$ ☐ $\cos \theta$ ☐ $\tan \theta$ 

● A. opposite  $\div$  adjacent

● B. opposite  $\div$  hypotenuse

● C. adjacent  $\div$  hypotenuse

2



## Complete the table

Fill in the empty boxes.

| Angle $\theta$ | $\sin \theta$ | $\cos \theta$ | $\tan \theta$ |
|----------------|---------------|---------------|---------------|
| $30^\circ$     |               | 0.866         |               |
| $45^\circ$     | 0.707         |               |               |
| $60^\circ$     |               | 0.5           |               |

### 3 Pick the answer

Circle the right answer.

1. In a right triangle, the hypotenuse is 10 and  $\theta = 30^\circ$ . What is the opposite side?

A 5

B 8.66

C 10

2.  $\tan \theta = 1$ . What is  $\theta$ ?

A  $30^\circ$

B  $45^\circ$

C  $60^\circ$

### 4 Calculator practice

Use the table or a calculator. Round to 1 decimal.

1.  $12 \times \sin 30^\circ =$  \_\_\_\_\_

2.  $8 \times \cos 60^\circ =$  \_\_\_\_\_

3.  $5 \times \tan 45^\circ =$  \_\_\_\_\_

4.  $20 \times \sin 60^\circ \approx$  \_\_\_\_\_

5.  $6 \times \tan 60^\circ \approx$  \_\_\_\_\_

6.  $4 \times \cos 30^\circ \approx$  \_\_\_\_\_

### 5 Find the angle

Fill in the empty boxes.

| Ratio                 | Angle $\theta$ |
|-----------------------|----------------|
| $\sin \theta = 0.5$   |                |
| $\cos \theta = 0.5$   |                |
| $\tan \theta = 1.732$ |                |
| $\sin \theta = 0.707$ |                |

## 6 True or false

Circle true or false.

1. In a right triangle,  $\sin \theta$  is never bigger than 1.
2.  $\tan 45^\circ = 1$
3.  $\cos 60^\circ = \sin 30^\circ$
4.  $\sin 30^\circ + \sin 30^\circ = \sin 60^\circ$
5. The hypotenuse is the side opposite the right angle.
6. When  $\theta$  gets bigger ( $0^\circ$  to  $90^\circ$ ),  $\cos \theta$  gets bigger.

True

False

True

False

True

False

True

False

True

False

True

False

## 7 Choose and use

Circle the right answer.

1. You know the hypotenuse and want the adjacent side. Use...

A  $\sin$

B  $\cos$

C  $\tan$

2. You know the opposite and adjacent sides. Use...

A  $\tan$

B  $\sin$

C  $\cos$

3. A ramp is 4 m long and rises at  $10^\circ$ . How high does it go? ( $\sin 10^\circ \approx 0.174$ )

A 3.9 m

B 0.4 m

C 0.7 m

4. A kite string is 50 m long and makes  $60^\circ$  with the ground. How high is the kite? ( $\sin 60^\circ \approx 0.866$ )

A 25 m

B 43.3 m

C 57.7 m

## 8 Think and write

From 40 m away, the angle of elevation to the top of a tower is  $35^\circ$ . How tall is the tower, to the nearest metre?

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How did it go?



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Math

Grade 10

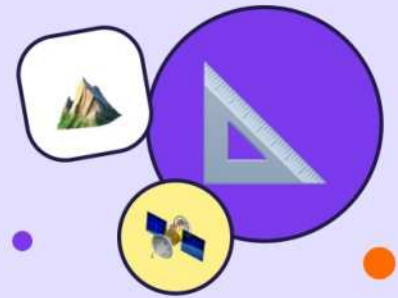
Answer key

# Trigonometry in right triangles

Use sine, cosine and tangent to find sides and angles.



I can choose and use sin, cos and tan.



1



## Match up

Draw a line to match each pair.

**B**  $\sin \theta$ **C**  $\cos \theta$ **A**  $\tan \theta$ **A.** opposite  $\div$  adjacent**B.** opposite  $\div$  hypotenuse**C.** adjacent  $\div$  hypotenuse

2



## Complete the table

Fill in the empty boxes.

| Angle $\theta$ | $\sin \theta$ | $\cos \theta$ | $\tan \theta$ |
|----------------|---------------|---------------|---------------|
| $30^\circ$     | 0.5           | 0.866         | 0.577         |
| $45^\circ$     | 0.707         | 0.707         | 1             |
| $60^\circ$     | 0.866         | 0.5           | 1.732         |

### 3 Pick the answer

Circle the right answer.

1. In a right triangle, the hypotenuse is 10 and  $\theta = 30^\circ$ . What is the opposite side?

A 5

B 8.66

C 10

2.  $\tan \theta = 1$ . What is  $\theta$ ?

A  $30^\circ$

B  $45^\circ$

C  $60^\circ$

### 4 Calculator practice

Use the table or a calculator. Round to 1 decimal.

1.  $12 \times \sin 30^\circ =$  6

2.  $8 \times \cos 60^\circ =$  4

3.  $5 \times \tan 45^\circ =$  5

4.  $20 \times \sin 60^\circ \approx$  17.3

5.  $6 \times \tan 60^\circ \approx$  10.4

6.  $4 \times \cos 30^\circ \approx$  3.5

### 5 Find the angle

Fill in the empty boxes.

| Ratio                 | Angle $\theta$ |
|-----------------------|----------------|
| $\sin \theta = 0.5$   | $30^\circ$     |
| $\cos \theta = 0.5$   | $60^\circ$     |
| $\tan \theta = 1.732$ | $60^\circ$     |
| $\sin \theta = 0.707$ | $45^\circ$     |

## 6 True or false

Circle true or false.

1. In a right triangle,  $\sin \theta$  is never bigger than 1.
2.  $\tan 45^\circ = 1$
3.  $\cos 60^\circ = \sin 30^\circ$
4.  $\sin 30^\circ + \sin 30^\circ = \sin 60^\circ$
5. The hypotenuse is the side opposite the right angle.
6. When  $\theta$  gets bigger ( $0^\circ$  to  $90^\circ$ ),  $\cos \theta$  gets bigger.

True

False

True

False

True

False

True

False

True

False

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## 7 Choose and use

Circle the right answer.

1. You know the hypotenuse and want the adjacent side. Use...

A  $\sin$

B  $\cos$

C  $\tan$

2. You know the opposite and adjacent sides. Use...

A  $\tan$

B  $\sin$

C  $\cos$

3. A ramp is 4 m long and rises at  $10^\circ$ . How high does it go? ( $\sin 10^\circ \approx 0.174$ )

A 3.9 m

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A 25 m

B 43.3 m

C 57.7 m

## 8 Think and write

From 40 m away, the angle of elevation to the top of a tower is  $35^\circ$ . How tall is the tower, to the nearest metre?

$$40 \times \tan 35^\circ \approx 28 \text{ m}$$

How did it go?



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