TRIGONOMETRY
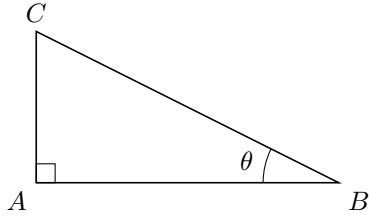
A RIGHT-ANGLED TRIANGLE
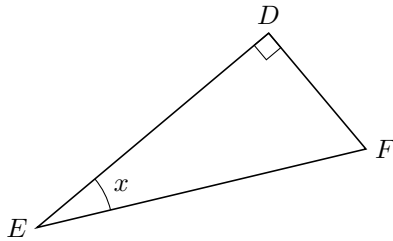
A.1 IDENTIFYING TRIANGLE SIDES

MCQ 1:   In the triangle below, identify the adjacent side to the angle θ:
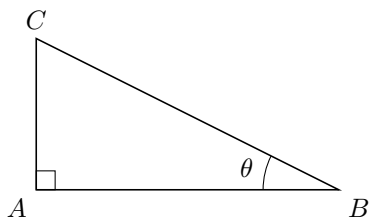

- ☐ $\overline{AB}$
- ☐ $\overline{AC}$
- ☐ $\overline{BC}$

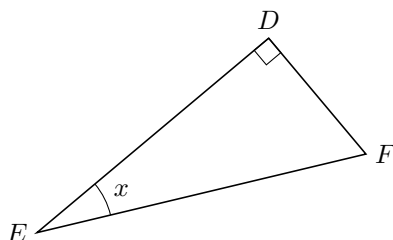**MCQ 2:**   In the triangle below, identify the hypotenuse relative to the angle x:

- ☐ $\overline{DE}$
- ☐ $\overline{DF}$
- ☐ $\overline{EF}$

MCQ 3:   In the triangle below, identify the opposite side to the angle θ:
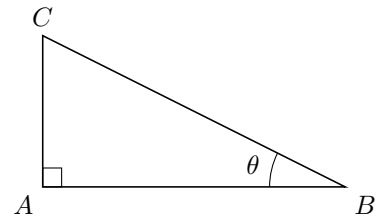

- ☐ $\overline{AB}$
- ☐ $\overline{AC}$
- ☐ $\overline{BC}$

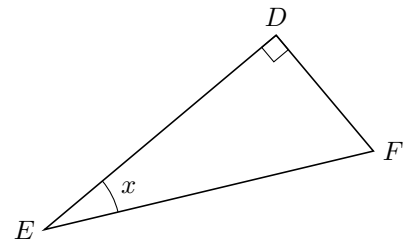**MCQ 4:**   In the triangle below, identify the opposite side to the angle x:

- ☐ $\overline{DE}$
- ☐ $\overline{DF}$
- ☐ $\overline{EF}$

MCQ 5:   In the triangle below, identify the hypotenuse relative to the angle θ:

- ☐ $\overline{AB}$
- ☐ $\overline{AC}$
- ☐ $\overline{BC}$

MCQ 6:   In the triangle below, identify the adjacent side to the angle x:
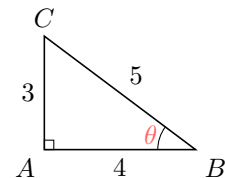

- ☐ $\overline{DE}$
- ☐ $\overline{DF}$
- ☐ $\overline{EF}$

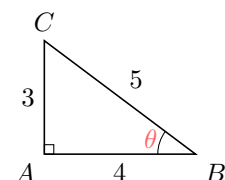## B TRIGONOMETRIC FUNCTIONS

B.1 CALCULATING TRIGONOMETRIC RATIOS

Ex 7:
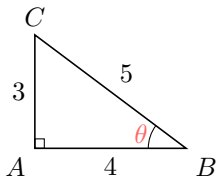

Calculate $\cos(\theta)$.

$$\cos(\theta) = \boxed{}$$

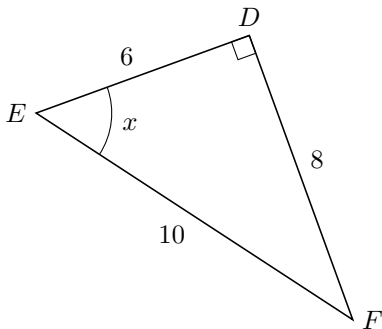**Ex 8:**

Calculate $\sin(\theta)$.

$$\sin(\theta) = \boxed{}$$

Ex 9:

Calculate $\tan(\theta)$.

$$\tan(\theta) = \boxed{}$$

Ex 10:

Calculate $\sin(x)$.

$$\sin(x) = \boxed{}$$

Ex 11:
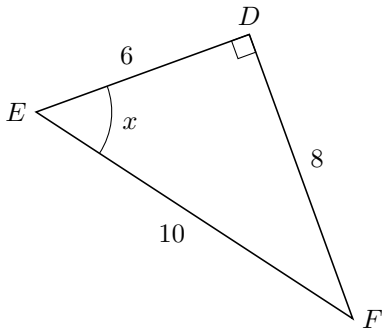
Calculate $\tan(x)$.

$$\tan(x) = \boxed{}$$

Ex 12:
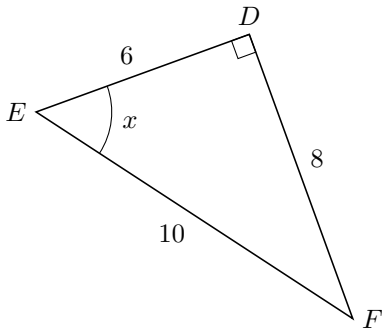
Calculate $\cos(x)$.

$$\cos(x) = \boxed{}$$

B.2 CALCULATING SIDE LENGTHS

Ex 13:
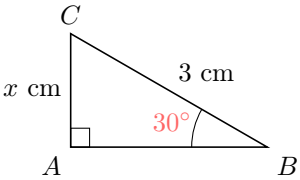
Calculate x.

$$x \approx \boxed{} \text{ cm (round to 2 decimal places)}$$

Ex 14:
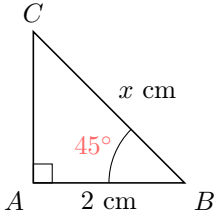
Calculate x.

$$x \approx \boxed{} \text{ cm (round to 2 decimal places)}$$

Ex 15:
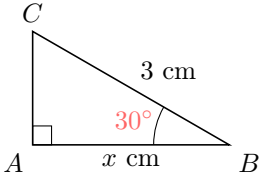
Calculate x.

$$x \approx \boxed{} \text{ cm (round to 2 decimal places)}$$

Ex 16:
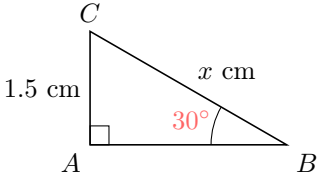
Calculate x.

$$x \approx \boxed{} \text{ cm (round to 2 decimal places)}$$

Ex 17:

C

1.5 cm

30°

A   x cm   B
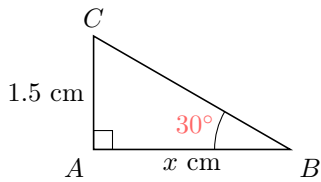
Calculate x.

x ≈ ⬚ cm (round to 2 decimal places)

Ex 18: 🖩

C

x cm

40°

A   3 cm   B
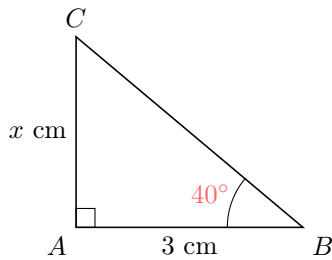
Calculate x.

x ≈ ⬚ cm (round to 2 decimal places)

C INVERSE TRIGONOMETRIC FUNCTIONS

C.1 CALCULATING ANGLES

Ex 19: 🖩
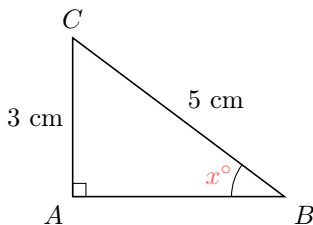
C

3 cm   5 cm

x°

A   B

Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

Ex 20: 🖩
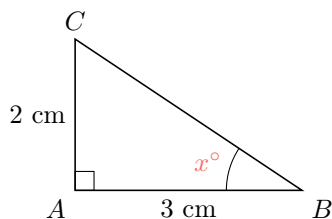
C

2 cm

x°

A   3 cm   B

Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

Ex 21: 🖩
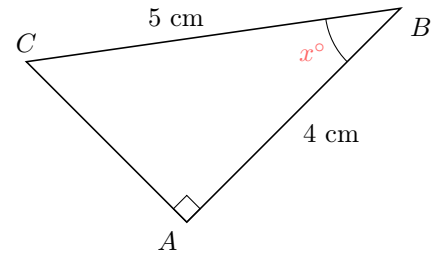
5 cm   B

C   x°

4 cm

A

Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

Ex 22: 🖩

C

1.5 cm   x°

A   3 cm   B
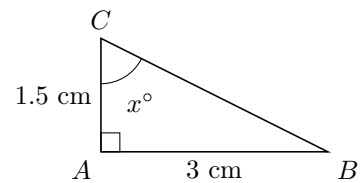
Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

Ex 23: 🖩

A

3 cm

x°

B

4.5 cm   C
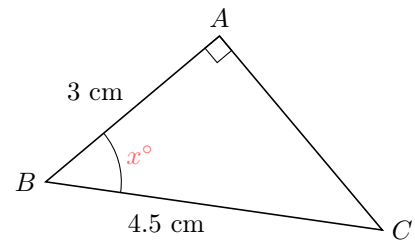
Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

Ex 24: 🖩

C

3 cm

A

4 cm

x°

B
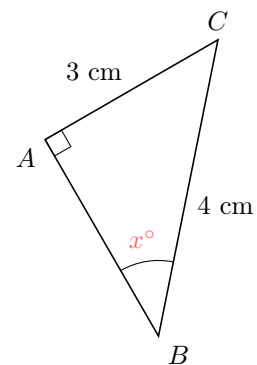
Calculate the angle x°.

x° ≈ ⬚° (round to 1 decimal place)

D   SOLVING   REAL-WORLD TRIGONOMETRY PROBLEMS

D.1   SOLVING   REAL-WORLD   TRIGONOMETRY PROBLEMS

Ex 25: A cyclist in France rides up a long incline with an average rise of 6°. If he rides for 6 200 m, how far has he climbed vertically?

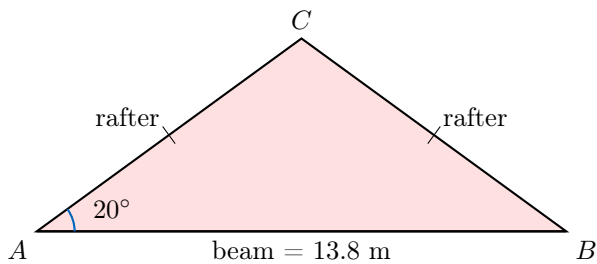 | _____ | m (round to the nearest integer)

Ex 26: The lamp in a lighthouse is 64 m above sea level. The angle of depression from the lamp to a fishing boat is 11°. How far horizontally is the boat from the lighthouse?

    | _____ | m (round to the nearest integer)

Ex 27: For the triangular roof truss illustrated, find the length of a rafter if the beam is 13.8 m and the pitch is 20°.

    | _____ | m (round to 2 decimal places)

Ex 28: A person standing 50 m from the base of a tower looks up at the top with an angle of elevation of 28°. Find the height of the tower.

    | _____ | m (round to the nearest integer)