

Solutions

Award method and answer marks as indicated; accept equivalent correct methods.

2.1

- $O = H \sin \theta = 12 \sin 30^\circ = \mathbf{6}$ cm.

2.2

- $A = H \cos \theta = 14 \cos 60^\circ = \mathbf{7}$ cm.

2.3

- $\theta = \tan^{-1}(O/A) = \tan^{-1}(5/12) = \mathbf{22.6^\circ}$.

2.4

- $\theta = \tan^{-1}(3/7) = \mathbf{23.2^\circ}$ to one decimal place.

3.1

(a)

- Angle is from north, so north is adjacent: $N = 10 \cos 40^\circ = \mathbf{7.66}$ km.

(b)

- East is opposite: $E = 10 \sin 40^\circ = \mathbf{6.43}$ km.

(c)

- Reverse bearing: $b = 40 + 180 = \mathbf{220^\circ}$.

3.2

(a)

- Height is opposite and 12 m is adjacent, so $\tan \theta = h/d$.
- Rearrange $h = d \tan \theta$.
- $h = 12 \tan 38^\circ \approx \mathbf{9.38}$ m.

(b)

- Use $\cos \theta = d/H$, so $H = d/\cos \theta$.
- $H = 12/\cos 38^\circ \approx \mathbf{15.2}$ m.
- Sine requires the hypotenuse as its denominator; 12 m is adjacent, not hypotenuse.