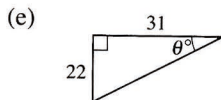
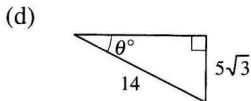
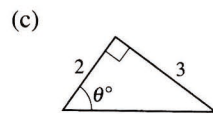
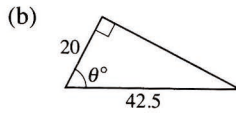
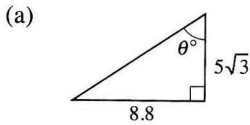


Exercise 10D

1 For each triangle sketched below,

- (i) use Pythagoras' theorem to find the length of the third side in an exact form;
 (ii) write down the exact values of $\sin \theta^\circ$, $\cos \theta^\circ$ and $\tan \theta^\circ$.



- 2 (a) Given that angle A is obtuse and that $\sin A^\circ = \frac{5}{14}\sqrt{3}$, find the exact value of $\cos A^\circ$.
 (b) Given that $180 < B < 360$ and that $\tan B^\circ = -\frac{21}{20}$, find the exact value of $\cos B^\circ$.
 (c) Find all possible values of $\sin C^\circ$ for which $\cos C^\circ = \frac{1}{2}$.
 (d) Find the values of D for which $-180 < D < 180$ and $\tan D^\circ = 5 \sin D^\circ$.

3 Use $\tan \theta^\circ \equiv \frac{\sin \theta^\circ}{\cos \theta^\circ}$, $\cos \theta^\circ \neq 0$, and $\cos^2 \theta^\circ + \sin^2 \theta^\circ \equiv 1$ to establish the following.

(a) $\frac{1}{\sin \theta^\circ} - \frac{1}{\tan \theta^\circ} \equiv \frac{1 - \cos \theta^\circ}{\sin \theta^\circ}$

(b) $\frac{\sin^2 \theta^\circ}{1 - \cos \theta^\circ} \equiv 1 + \cos \theta^\circ$

(c) $\frac{1}{\cos \theta^\circ} + \tan \theta^\circ \equiv \frac{\cos \theta^\circ}{1 - \sin \theta^\circ}$

(d) $\frac{\tan \theta^\circ \sin \theta^\circ}{1 - \cos \theta^\circ} \equiv 1 + \frac{1}{\cos \theta^\circ}$

4 Solve the following equations for θ , giving all the roots in the interval $0 \leq \theta \leq 360$ correct to the nearest 0.1.

(a) $4 \sin^2 \theta^\circ - 1 = 0$

(b) $\sin^2 \theta^\circ + 2 \cos^2 \theta^\circ = 2$

(c) $10 \sin^2 \theta^\circ - 5 \cos^2 \theta^\circ + 2 = 4 \sin \theta^\circ$

(d) $4 \sin^2 \theta^\circ \cos \theta^\circ = \tan^2 \theta^\circ$

5 Find all values of θ , $-180 < \theta < 180$, for which $2 \tan \theta^\circ - 3 = \frac{2}{\tan \theta^\circ}$.

Miscellaneous exercise 10

1 Write down the period of each of the following.

(a) $\sin x^\circ$

(b) $\tan 2x^\circ$

2 By considering the graph of $y = \cos x^\circ$, or otherwise, express the following in terms of $\cos x^\circ$.

(a) $\cos(360 - x)^\circ$

(b) $\cos(x + 180)^\circ$

3 Draw the graph of $y = \cos \frac{1}{2} \theta^\circ$ for θ in the interval $-360 \leq \theta \leq 360$. Mark clearly the coordinates of the points where the graph crosses the θ - and y -axes.

4 Solve the following equations for θ , giving your answers in the interval $0 \leq \theta \leq 360$.

(a) $\tan \theta^\circ = 0.4$

(b) $\sin 2\theta^\circ = 0.4$