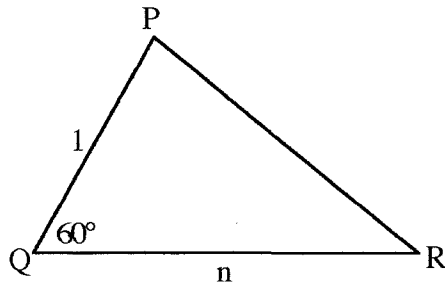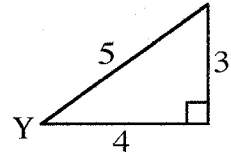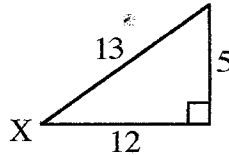# COMPOUND ANGLE FORMULAE

1

Find an expression for the length of the side PR.

2   (a)   Write down the formula for $\cos(X + Y)$.

     (b)   Using the right angled triangles, show that $\cos(X + Y) = \dfrac{33}{65}$.

3   Write in shorter form and simplify:

    (a) $2\sin 30°\cos 30°$

    (b) $\sin(45 + x)°\cos(45 - x)° + \cos(45 + x)°\sin(45 - x)°$

4   If $\sin P = \dfrac{2}{3}$, $0 < P < \dfrac{\pi}{2}$, find the exact value of $\cos 2P$.

5   Solve:

    (a) $2\sin\theta - \sqrt{3} = 0$, $0 \le \theta \le 2\pi$

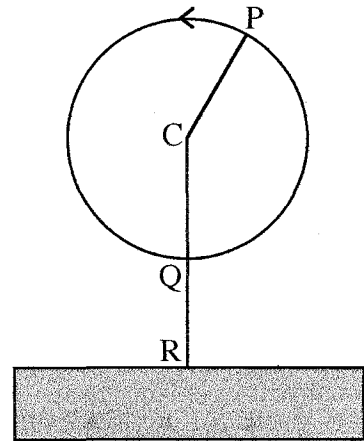   (b) $3\sin 2x° + 2\cos x° = 0$, $0 \le x \le 360$

    (c) $\cos 2\theta - \sin\theta = 0$, $0 \le \theta \le 2\pi$

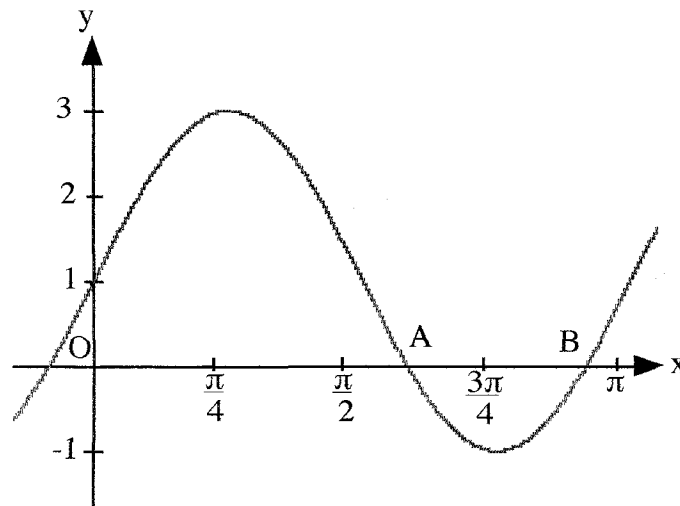6   Prove that $\tan A + \tan B = \dfrac{\sin(A + B)}{\cos A \cos B}$.

7   The particle P turns in a circle about the
    point C so that the height of the particle
    above ground at any time t seconds is
    given by

$$h(t) = 2 + \sin(30t + 60)°$$

(a)   What is the length of QR?

(b)   What is the first time that particle P
      reaches Q?

8   The diagram below shows the graph of $y = 2\sin2x + 1$ for $0 \le \theta \le 2\pi$.

(a)   Find the coordinates of A and B by solving an appropriate equation
      algebraically.

(b)   The points $(0, 2)$ and $(\pi, 0)$ are joined by a straight line l.
      In how many points does l intersect the given graph?

(c)   C is the point on the given graph with an x-coordinate of $\frac{\pi}{2}$.
      Explain whether C is above, below or on the line.