Trigonometric Equations

1. Solve the following equations.

(a) $2\sin 2x + 1 = 0$ $\qquad$ $0 \leq x \leq 360$ $\qquad$ (b) $2\cos 2x + \sqrt{3} = 2\sqrt{3}$ $\qquad$ $0 \leq x \leq 2\pi$

(c) $3\tan^2 x - 1 = 0$ $\qquad$ $0 \leq x \leq 2\pi$ $\qquad$ (d) $3\cos^2 x - 2\cos x - 1 = 0$ $\qquad$ $0 \leq x \leq 360$

(e) $4\tan 3x + 6 = 9$ $\qquad$ $0 \leq x \leq 360$ $\qquad$ (f) $4 + 5\sin 3x = 3$ $\qquad$ $0 \leq x \leq 180$

(g) $6\tan^2 x - 7\tan x = -2$ $\quad$ $0 \leq x \leq 360$ $\qquad$ (h) $4\sin^2 x - 1 = 2$ $\qquad$ $0 \leq x \leq \pi$

(i) $6\sin 2x - 1 = -3$ $\qquad$ $0 \leq x \leq 180$ $\qquad$ (j) $6\sin^2 x - 5\sin x = 6$ $\qquad$ $0 \leq x \leq 360$

(k) $3 + 6\sin (2x - 60) = 0$ $\quad$ $0 \leq x \leq 2\pi$ $\qquad$ (l) $4\tan (2x + 15) - 7 = 9$ $\qquad$ $0 \leq x \leq 360$

2. (a) The diagram shows the graph of
$\quad$ $y = a\sin bx + c$.
$\quad$ Write down the value of a, b and c.

$\quad$ (b) Find the coordinates of P and Q,
$\quad$ the points of intersection with this
$\quad$ curve and the line $y = 2$.
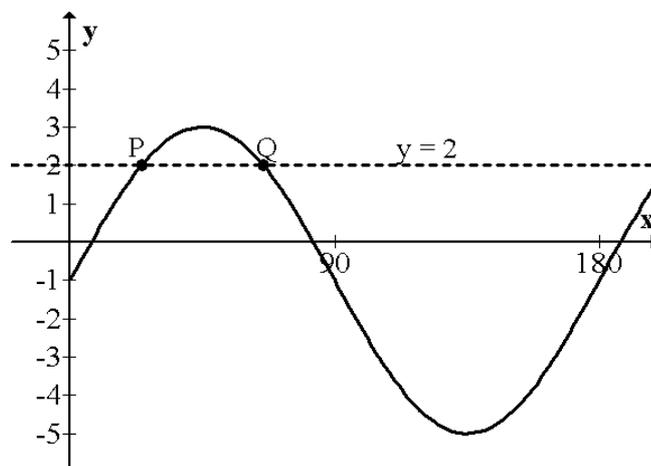
3. (a) The diagram shows the graph of
$\quad$ $y = a\cos bx + c$.
$\quad$ Write down the values of a, b and c.

$\quad$ (b) Find the points of intersection of the
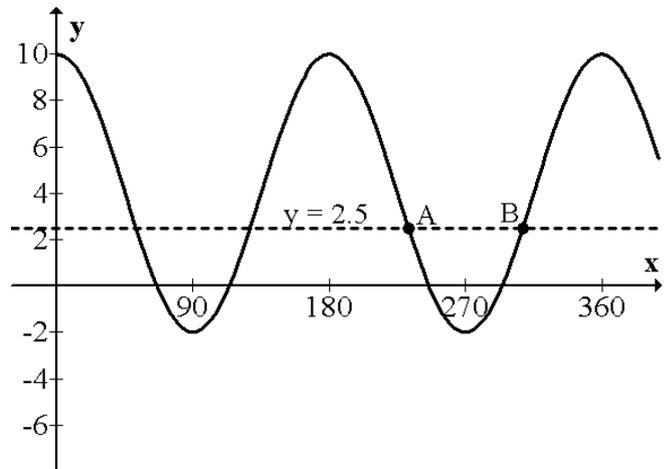$\quad$ line $y = 3$ and this curve.
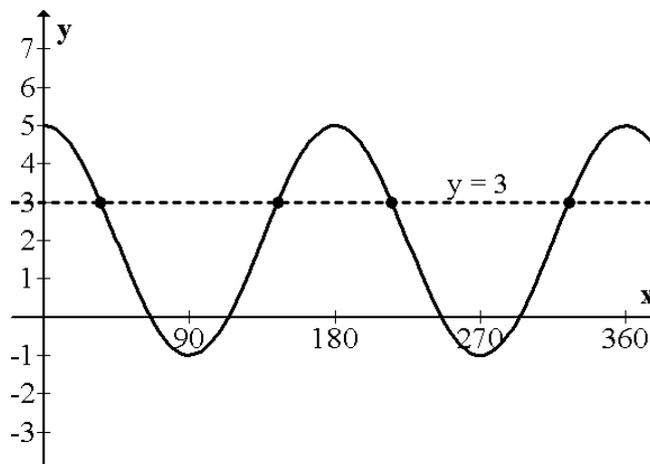
4. (a) The diagram opposite shows the graph of
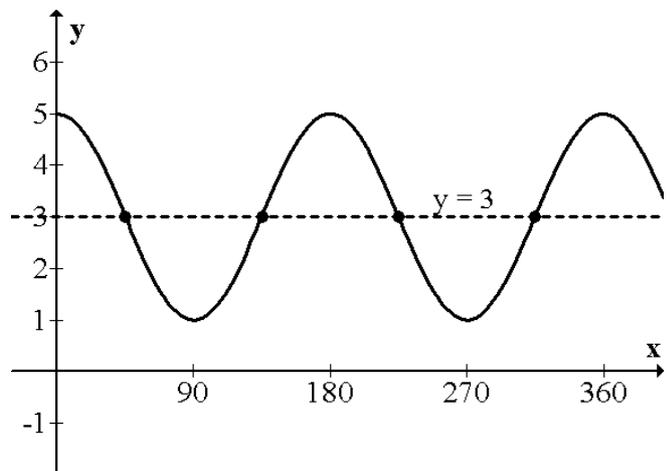$y = p\sin qx + r$.
Write down the equation of this graph.
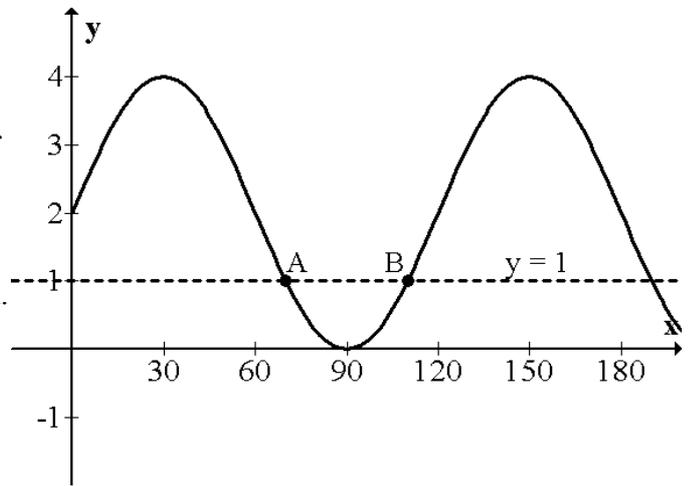
(b) The line $y = 1$ is drawn on the same graph.
Find the coordinates of A and B.

5. (a) The diagram opposite shows the graph of
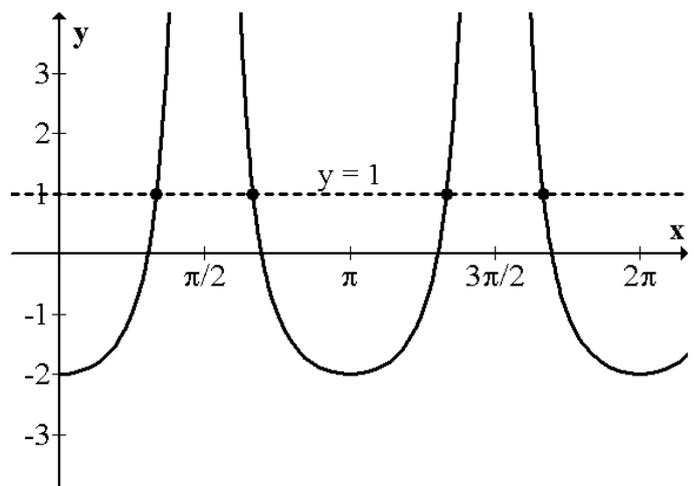$y = a\cos bx + c$.
Write down the equation of this graph.

(b) Find the coordinates of A and B,
points of intersection of the curve and
the line $y = 2.5$.

6. The diagram shows the graph of
$y = 4\cos^2 x + 1$.

Find the points of intersection of
this curve and the line $y = 3$ in
the range $0 \le x \le 360$

7. The diagram shows the graph of
$y = \tan^2 x - 2$.

Find the points of intersection of
this curve and the line $y = 1$ in
the range $0 \le x \le 2\pi$.