

1. Solve each of the following equations for $0^\circ \leq x^\circ \leq 360^\circ$

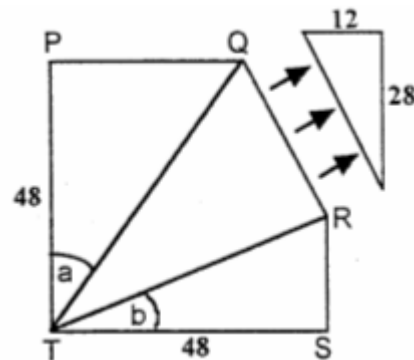
(a) $\cos 2x^\circ - 3 \sin x^\circ = 2 \sin^2 x^\circ$ (b) $3 \cos 2x^\circ - 2 \sin x^\circ - 1 = 0$

2. Solve each of the following equations for $0 \leq \vartheta \leq 2\pi$

(a) $\cos 2\vartheta - \cos \vartheta = -1$ (b) $4 \sin 2\vartheta = 5 \sin \vartheta$

3. Given that $\tan A = \frac{3}{4}$ and $\tan B = \frac{5}{12}$, where $(A, B < \frac{\pi}{2})$, find the exact value of $\sin(A + B)$.

4. In the diagram, a square has a triangle cut from one corner. The resulting shape $PQRST$ is a pentagon.

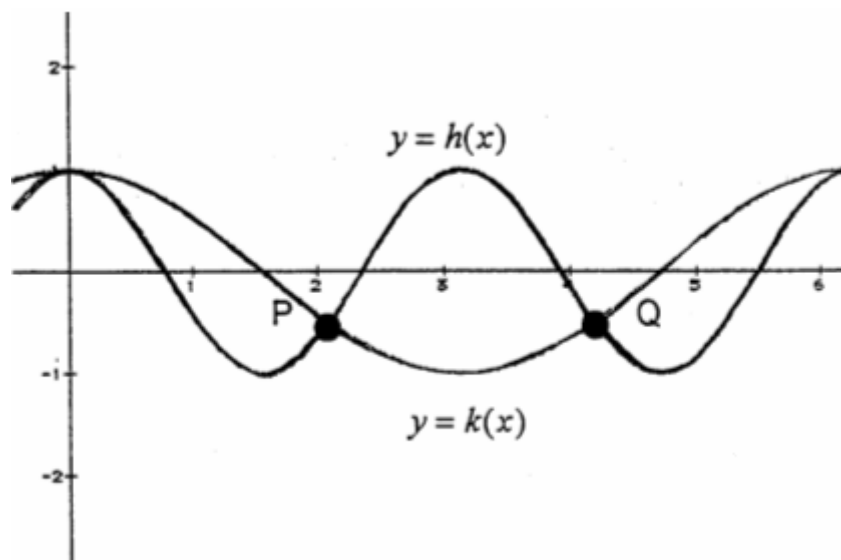


- (a) Calculate the lengths of PQ , TQ , RS and TR .
- (b) Write down an expression for the size of angle QTR , in terms of a and b .

(c) Show that $\sin QTR = \frac{33}{65}$.

5. (a) Solve the equation $\cos 2x^\circ = \cos x^\circ$ for $0^\circ \leq x^\circ \leq 360^\circ$.

(b) The diagram below shows parts of the graph of two cosine functions, h and k . State expressions for $h(x)$ and $k(x)$.



(c) Use your answers to part (a) to find the coordinates of P and Q.

(d) Hence state the values of x in the interval $0^\circ \leq x^\circ \leq 360^\circ$ for which $\cos 2x^\circ < \cos x^\circ$.