

**Mathematics Department – Langholm Academy**

**HIGHER HOMEWORK**

**UNIT 2**

**CHAPTER 3.2**

**Compound Angle Formulae 2**

**Higher - Unit 2**  
**Compound Angle Formulae 2**

1. Solve the following equations, for  $0 \leq x \leq 360$

a.  $\sin 2x + \sin x = 0$

b.  $\cos 2x - \cos x = 0$

c.  $\cos 2x - \sin x - 1 = 0$

d.  $4 \cos 2x - 2 \sin x - 1 = 0$

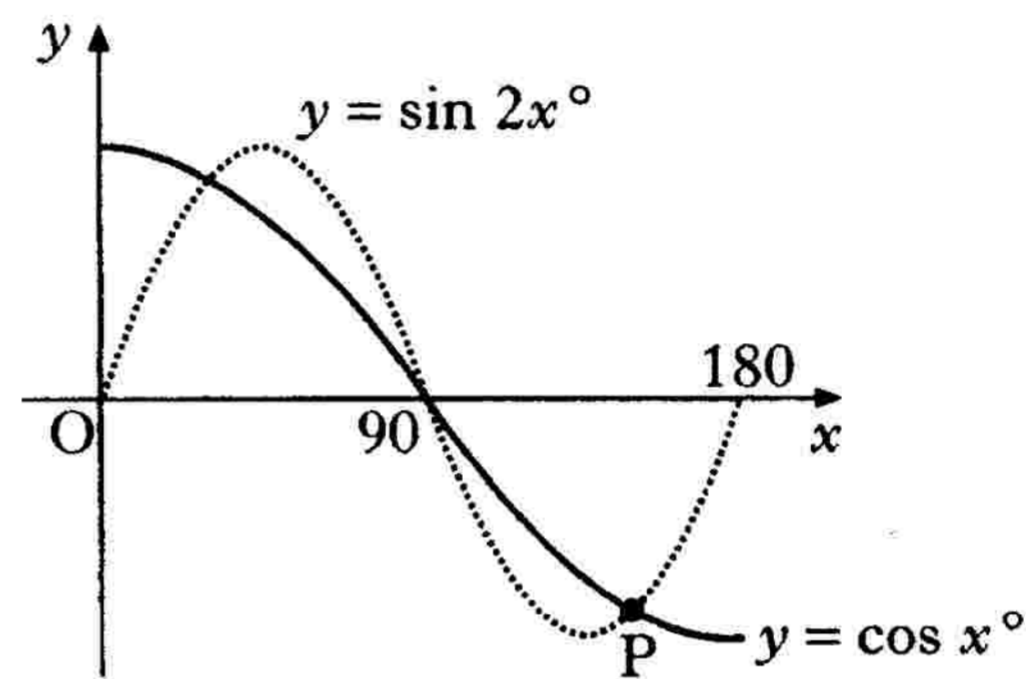
2. Solve the following equations, for  $0 \leq \theta \leq 2\pi$

a.  $\sin 2\theta - \sin \theta = 0$

b.  $\cos 2\theta + \sin \theta = 0$

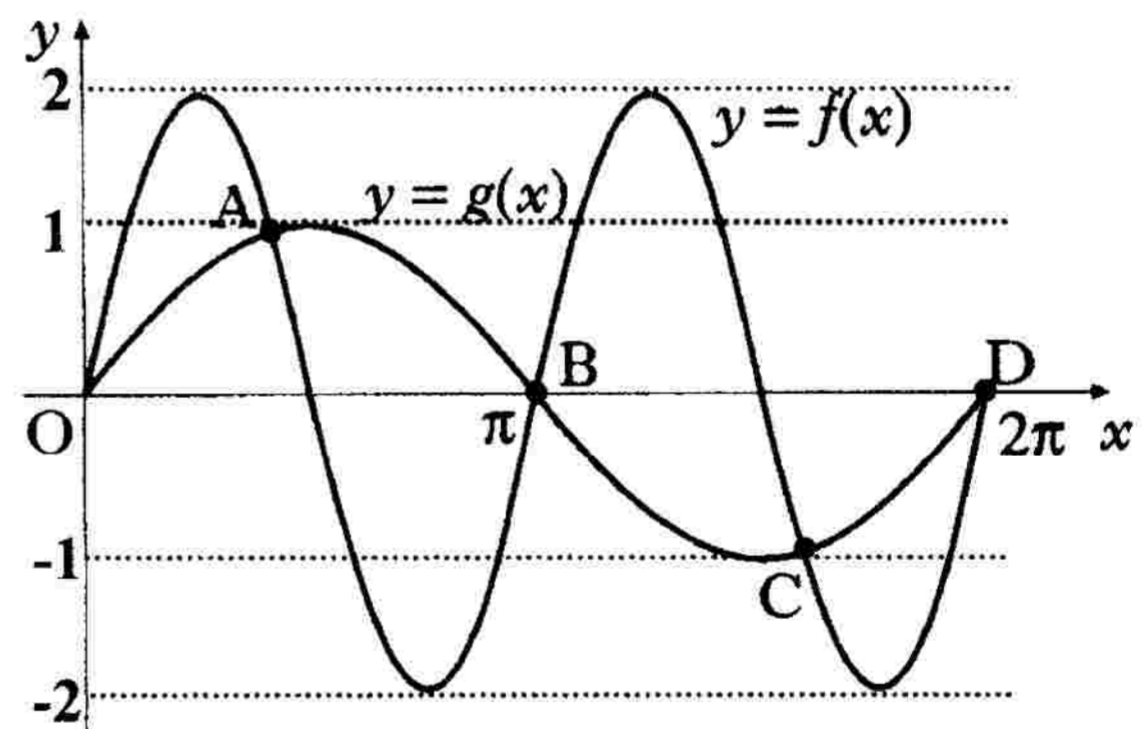
3. The diagram shows the graphs of  $y = \sin 2x$  and  $y = \cos x$  in the interval  $0 \leq x \leq 180$ .

Calculate the coordinates of the point P



4. The diagram (not to scale) shows the graphs of  $y = g(x)$  and  $y = f(x)$  in the interval  $0 \leq \theta \leq 2\pi$ .

- a. State the equations of  $y = g(x)$  and  $y = f(x)$
- b. Calculate the coordinates of A and C (answers in radians to 2 dp)



5. By expressing  $3x$  as  $2x + x$  prove that

a.  $\cos 3x = 4 \cos^3 x - 3 \cos x$

b.  $\sin 3x = 3 \sin x - 4 \sin^3 x$

6. Sketch the following graphs showing max/min and all axis crossings

a.  $y = \sin\left(\theta - \frac{\pi}{3}\right) \quad 0 \leq \theta \leq 2\pi$

b.  $y = \cos\left(2\theta + \frac{\pi}{6}\right) \quad 0 \leq \theta \leq \pi$