(a) $\cos 4x = 0.38 = \cos 67.6663^\circ$

$0 \le x \le 2\pi$ or $0 \le x \le 360$

Remember

i) $\sin\theta = \sin\alpha$
$\theta = n\pi + (-1)^n \alpha$

ii) $\cos\theta = \cos\alpha$
$\theta = 2n\pi \pm \alpha$

iii) $\tan\theta = \tan\alpha$
$\theta = n\pi + \alpha$

$4x = 2n\times 180^\circ \pm 67.6663^\circ$

$= 360^\circ n \pm 67.6663^\circ$

$\Rightarrow x = \dfrac{360^\circ n \pm 67.6663^\circ}{4}$

$\boxed{x = 90^\circ n \pm 16.9165^\circ}$

put $n=0$, $x = 16.9165^\circ$ ✓

$n=2$, $x = 180^\circ + 16.9165$

$= 196.9165^\circ$ ✓

$x = 180^\circ - 16.9165$

$= 163.0834$ ✓

$n=3$ $x = 270^\circ \pm 16.9165^\circ$

$= 270 + 16.9165^\circ = 286.9165^\circ$ ✓

$x = 270 - 16.9165^\circ = 253.0835^\circ$ ✓

$n=4$ $x = 360^\circ \pm 16.9165^\circ$

$= 360 + 16.9165$ X 360

$x = 360 - 16.9165^\circ = 343.0835^\circ$

Solutions are ~~$x = 16.9165^\circ$~~, 163.834°,

$\boxed{x = 16.92^\circ, 163.83^\circ, 196.92^\circ, 253.08^\circ, 286.92^\circ \text{ and } 343.08^\circ}$

(b) $\sin\left(\frac{4}{3}x\right) = -0.35 = \sin(-20.48)$

$\Rightarrow \frac{4}{3}x = 180^\circ n + (-1)^n(-20.48^\circ)$

$\Rightarrow x = \dfrac{3\times 180^\circ n + (-1)^n(-20.48^\circ)\times 3}{4}$

$\boxed{x = 135 n + (-1)^n(-15.36)}$

Put $n=0$ $\quad x = -15.36$ ✗

$n=1$, $\quad 180 + 15.36 = \underline{150\ 36^\circ}$ ✓

$n=2$, $\quad 360 - 15\ 36 = \underline{254.64^\circ}$ ✓

$n=3$, $\quad 605 + 15.36$ ✗

$$\boxed{x = 150\ 36^\circ,\ 254.64^\circ}$$ ✓

(c) $\tan\left(\frac{1}{2}x\right) = 5 = \tan 78.69506$

$\Rightarrow \frac{1}{2}x = 180^\circ \times n + 78.69506$

$\rightarrow x = 360^\circ \times n + 157.38012$

$$\boxed{x = 360^\circ \times n + 157\ 38012}$$

Put $n=0$

$x = \underline{157.38012}$ ✓

$n=1$, $x = 360 + 157\ 380\ldots$ ✗

Coln $\boxed{x = 157.38^\circ}$ ✓

(d)

$\sin 2x = 0.62 = \sin 38.31613^\circ$

(e) General solution

$2x = 180^\circ \times n + (-1)^n (38.31613^\circ)$

$\Rightarrow \boxed{x = 90^\circ \times n + (-1)^n (19.158065^\circ)}$ ✓

(a) Put $n=0$

$x = 19.16^\circ$ ✓

$n=1$

$x = 90^\circ - 19\ 1580650$

$x = 70.84193^\circ$ ✓

h22

$$x = 180^\circ + 19.158065^\circ$$

$$= 199.158065^\circ \checkmark$$

h23.

$$x = 270^\circ - 19.158065^\circ$$

$$= 250.8419 \checkmark$$

h24

$$x = 360^\circ + 19.158065^\circ \times$$

Solutions are:

$$\boxed{x = 19.16^\circ, 70.14^\circ, 199.16^\circ, 250.84^\circ}$$ ✓

(3)

$$3\cos x = 0.65x$$

$$\Rightarrow \cos x = \left(\frac{0.65}{3}\right)x$$

$$\boxed{y = \cos x} \qquad y = \left(\frac{0.65}{3}\right)x$$

$$\boxed{y = 0.2167x}$$

There will be 2 solutions of this equation. between $0 \to 2\pi$

One will be just before 90°

and other will be after 270°.