5) $\bar{X} = \frac{\sum x_i n_i}{N}$ where $N = \sum n_i$ & $y_i = 10x_i - 4$ (given).

so, $\bar{Y} = \frac{\sum y_i \cdot n_i}{N}$

$= \frac{\sum[(10x_i - 4) \times n_i]}{N}$ $\frac{1}{2}$

$\bar{Y} = \sum\left[\frac{10x_i n_i - 4n_i}{N}\right]$

$= 10\sum\frac{x_i n_i}{N} - 4\frac{\sum n_i}{N}$

Thus, $\bar{Y} = 10\bar{X} - 4$ $\frac{1}{4}$ $\boxed{a}$ $\frac{1}{4}$

2nd ex: 1) If α is acute (given)

the $0 < \cos\alpha < 1$ $\frac{1}{4}$ & $\cos\alpha = m$

hence, $0 < m < 1$

$\frac{1}{4}$ but $m = \frac{4\sqrt{2}}{9} = \sqrt{\frac{32}{81}} < 1$ $\frac{1}{4}$

$\frac{1}{4}$ & $m = \sqrt{\frac{32}{81}} > 0$

Thus, $m = \frac{4\sqrt{2}}{9}$ is correct answer.

2) $\sin^2\alpha + \cos^2\alpha = 1$ pythagorean identity

$\sin^2\alpha = 1 - \cos^2\alpha$

$\frac{1}{2}$ $\sin^2\alpha = 1 - m^2$

$= 1 - \frac{32}{81}$

$\sin^2\alpha = \frac{49}{81}$

$\sin\alpha = \mp\frac{7}{9}$

but α is acute.

Thus $\boxed{\sin\alpha = \frac{7}{9}}$ $\frac{1}{4}$

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha}$

$\frac{3}{4}$ $= \frac{\frac{7}{9}}{\frac{4\sqrt{2}}{9}}$

$\boxed{\tan\alpha = \frac{7\sqrt{2}}{8}}$

3) (d): $\left\{\begin{array}{l} \text{- passing through } D(-1, 4) \\ \text{- makes } \alpha \text{ with } x\text{-axis} \\ \text{- decreasing.} \end{array}\right\}$ given.

then $\text{slope}_{(d)} = -\tan\alpha$

$\frac{1}{4}$ $= -\frac{7\sqrt{2}}{8}$

(d): $\frac{y - y_D}{x - x_D} = \frac{-7\sqrt{2}}{8}$

$\frac{1}{2}$ $\frac{y - 4}{x + 1} = \frac{-7\sqrt{2}}{8}$

$8y - 32 = -7\sqrt{2}x - 7\sqrt{2}$

(d): $y = -\frac{7\sqrt{2}x}{8} - \frac{7\sqrt{2}}{8} + \frac{32}{8}$. $\frac{1}{4}$