1) a) $g(x) = 2x - 3$. Put $y = 2x - 3$ and make x the subject

$y + 3 = 2x$ so $x = \frac{y+3}{2}$

Now swap x and y $\therefore y = \frac{x+3}{2}$

$\therefore g^{-1}(x) = \frac{x+3}{2}$

b) $(g \circ g)(4) = g(g(4)) = g(2 \times 4 - 3) = g(5)$

$= 5^2 = \underline{25}$

2) $\cos\theta = \frac{u \cdot v}{|u||v|} = \frac{(3i + 4j + 5k) \cdot (4i - 5j - 3k)}{\sqrt{3^2 + 4^2 + 5^2}\ \sqrt{4^2 + (-5)^2 + (-3)^2}}$

$= \frac{12 - 20 - 15}{\sqrt{50}\ \sqrt{50}} = \frac{-23}{50}$ ANS $= \frac{-23}{50}$

3) a) $n = 10$

b) $a = p$ and $b = 2q$

c) $\binom{10}{5} p^5 (2q)^5$

4) a) $\log_2 32 = \log_2 2^5 = 5$

b) $\log_2 \left(\frac{32^{2x}}{8^y}\right) = \log_2 32^{2x} - \log_2 8^y$

$= \log_2 2^{10x} - \log_2 2^{3y} = 5x - 3y$