b) Same here, $\forall x P(x)$ ~~and~~ $\vee \exists x Q(x) \equiv$
$\equiv \forall x \exists y (P(x) \vee Q(y))$.

Home Work 15

18.

(25) If n is odd, this is the product of two odd numbers and therefore is odd, as desired. For example.

$n = 3 \rightarrow 2n = 6$

1, 2, 3, 4, 5, 6

1) $|1-2| = 1 \rightarrow 1, 3, 4, 5, 6,$
2) $|3-4| = 1 \rightarrow 1, 1, 5, 6$
3) $|5-6| = 1 \rightarrow 1, 1, 1,$
4) $|1-1| = 0 \rightarrow 1, 0$
5) $|1-0| = 1$

(27)

$n^4 = (10k+0)^4 = 10000k^4 = 10000k^4 + 0$

$n^4 = (10k+1)^4 = 10000k^4 + ??\cdot k^3 + ??k^2 + ??k^1 + 1$

$n^4 = (10k+2)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 16$

$n^4 = (10k+3)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 81$

$n^4 = (10k+4)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 256$

$n^4 = (10k+5)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 625$

$n^4 = (10k+6)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 1296$

$n^4 = (10k+7)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 2401$

$n^4 = (10k+8)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 4096$

$n^4 = (10k+9)^4 = 10000k^4 + ??k^3 + ??k^2 + ??k^1 + 6561$

$(t+w)^4 = t^4 + 4t^3w^1 + 6t^2w^2 + 4t^1w^3 + w^4$

(35)

$\sqrt{2}$ → irrational number

$\frac{a}{b}$ and $\frac{c}{b}$, $b > 0$

$a < c$

$(a+1)/b \leq c/b$

$x = (a + \frac{1}{2}\sqrt{2})/b$ is between $0 < \sqrt{2} < 2$

x → irrational number, but if x was rational, then $2(bx-a) = \sqrt{2}$. which is not correct.