1-

$$\underbrace{(p \rightarrow q)}_{A} \vee \underbrace{(\neg p \rightarrow r)}_{B} \quad C$$

| $\neg p$ | $p$ | $q$ | $r$ | A | B | C |
|---|---|---|---|---|---|---|
| F | T | T | T | T | T | T |
| F | T | T | F | T | T | T |
| F | T | F | T | F | T | T |
| F | T | F | F | F | T | T |
| T | F | T | T | T | T | T |
| T | F | T | F | T | F | F |
| T | F | F | T | T | T | T |
| T | F | F | F | T | F | F |

2. $\neg p \rightarrow (q \rightarrow r) \equiv q \rightarrow (p \vee r)$

$\equiv \neg(\neg p) \vee (\neg q \vee r)$

$\equiv p \vee (\neg q \vee r)$

$\equiv \neg q \vee (p \vee r)$

$\equiv q \rightarrow (p \vee r)$

3. if $5n+4$ is even (p) then $n$ is even (q) by contrapositive

We assume that $n$ is odd therefore $n = 2K+1$ $K \in \mathbb{Z}$

$$5(2K+1)+4 = 10K+9 = 10K+8+1$$

$h = 8K+8$ $h \in \mathbb{Z}$ $\therefore 2h+1$

We proved that $5n+4$ is odd by Contraposition $\square$