

5. Mind your P's and Q's

1. $\forall x (Q(x) \rightarrow \neg P(x))$ given

2. $\forall x ((P(x) \wedge \neg Q(x)) \rightarrow R(x))$ given

3. $\exists x P(x)$ given

4. $P(a)$ elim \exists : 3

5. $\forall x (P(x) \rightarrow \neg Q(x))$ Contrapositive: 1

6. $P(a) \rightarrow \neg Q(a)$ elim \forall : 5

7. $\neg Q(a)$ MP: 4, 6

8. $P(a) \wedge \neg Q(a)$ Intro \wedge : 4, 7

9. $(P(a) \wedge \neg Q(a)) \rightarrow R(a)$ elim \rightarrow : 2

10. $R(a)$ MP: 8, 9

11. $\exists x R(x)$ Intro \exists : 10

6. odd \times odd = odd

Let n and m both to be odd number