1.1) Proof by contradiction

Worked example	Your turn
Prove by deduction that $n^2 - 6n + 10$ is positive for all values of n	Prove by deduction that $n^2 - 8n + 17$ is positive for all values of n Proof

Worked example	Your turn
Prove by exhaustion that $n^2 - 10 < 0$ for $-3 < n \leq 3$ where n is an integer	Prove by exhaustion that $n^2 - 15 < 0$ for $-4 < n \leq 4$ where n is an integer Proof

Worked example	Your turn
Find a counter example to disprove the statement that $n^2 - n + 41$ is always a prime number.	Find a counter example to disprove the statement that if p is an odd prime, then $p + 2$ is also a prime $p = 7, 13, 19, 23, \ldots$

Worked example	Your turn
Prove by contradiction that there is no greatest even integer.	Prove by contradiction that there is no greatest odd integer. Proof

Worked example	Your turn
Prove by contradiction that if n^2 is odd, then n must be odd	Prove by contradiction that if n^2 is even, then n must be even Proof

Worked example	Your turn
Prove by contradiction that $\sqrt[3]{2}$ is an irrational number.	Prove by contradiction that $\sqrt{2}$ is an irrational number. Proof

Worked example	Your turn
Prove by contradiction that there are no integer solutions to the equation $x^2 - y^2 = 6$	Prove by contradiction that there are no integer solutions to the equation $x^2 - y^2 = 2$ Proof

Worked example	Your turn
Prove by contradiction that there exist no integers for which $20a + 14b = 3$	Prove by contradiction that there exist no integers for which $21a + 14b = 1$ Proof

Worked example	Your turn
Prove by contradiction that there exist no rational solutions to the equation $x^2 - 3 = 0$	Prove by contradiction that there exist no rational solutions to the equation $x^2 - 2 = 0$ Proof

Worked example	Your turn
Prove that if $\frac{a}{b}$ is an irrational number then at least one of a and b is an irrational number	Prove that if ab is an irrational number then at least one of a and b is an irrational number Proof

Worked example	Your turn
Prove that if $a - b$ is an irrational number then at least one of a and b is an irrational number	Prove that if $a + b$ is an irrational number then at least one of a and b is an irrational number Proof