 Question bank

Question bank for proof by induction

Part A – summative proofs

Prove by mathematical induction that the following formulas are true for every positive integer value of n.

| Number | Equation |
| --- | --- |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |

Part B – divisibility proofs

Prove by mathematical induction that the following formulas are true for every positive integer value of n.

| Number | Equation |
| --- | --- |
| 1 | is divisible by 3. |
| 2 | is divisible by 5. |
| 3 | The sum of the cubes of three consecutive integers is divisible by 3. |
| 4 | is an even number **i.e.** divisible by 2 |
| 5 | is divisible by 3. |
| 6 | is divisible by 4. |
| 7 | is divisible by 3 for all . |
| 8 | is divisible by 2 for all positive integers . |
| 9 | If then is divisible by for all positive integers .  (**Hint:** Add and subtract to then group terms and factor.) |
| 10 | If then is divisible by for all positive integers |