



Mathematical Induction Ex 12.1 Q1

$$P(n) : n(n+1) \text{ is even}$$

$$P(3) : 3.(3+1) \text{ is even}$$

Mathematical Induction Ex 12.1 Q2

$$P(n) : n^3 + n \text{ is divisible by 3}$$

$$P(3) : 3^3 + 3 \text{ is divisible by 3}$$

$$\Rightarrow P(3) : 30 \text{ is divisible by 3.}$$

$$\therefore P(3) \text{ is true}$$

Now,

$$P(4) : 4^3 + 3 = 67 \text{ is divisible by 3}$$

Since, 67 is not divisible by 3

So, $P(4)$ is not true

Mathematical Induction Ex 12.1 Q3

$$P(n) : 2^n \geq 3n$$

Given that $P(r)$ is true

$$\Rightarrow 2^r \geq 3r$$

Multiplying both the sides by 2,

$$2.2^r \geq 2.3r$$

$$2^{r+1} \geq 6r$$

$$\geq 3r + 3r$$

$$\geq 3 + 3r,$$

$$[\text{Since } 3r \geq 3 \Rightarrow 3r + 3r \geq 3 + 3r]$$

$$2^{r+1} \geq 3(r+1)$$

$$\Rightarrow P(r+1) \text{ is true}$$

***** END *****

