



Increasing and Decreasing Functions Ex 17.2 Q1(ix)

We have,

$$f(x) = 2x^3 - 15x^2 + 36x + 1$$

$$\therefore f'(x) = 6x^2 - 30x + 36$$

Critical points

$$\Rightarrow 6(x^2 - 5x + 6) = 0$$

$$\Rightarrow (x - 3)(x - 2) = 0$$

$$\Rightarrow x = 3, 2$$

Clearly,  $f'(x) > 0$  if  $x < 2$  and  $x > 3$

$$f'(x) < 0 \text{ if } 2 < x < 3$$

Thus,  $f(x)$  increases in  $(-\infty, 2) \cup (3, \infty)$ , decreases in  $(2, 3)$ .

Increasing and Decreasing Functions Ex 17.2 Q1(x)

We have,

$$f(x) = 2x^3 + 9x^2 + 12x - 1$$

$$\therefore f'(x) = 6x^2 + 18x + 12$$

Critical points

$$f'(x) = 0$$

$$\Rightarrow 6(x^2 + 3x + 2) = 0$$

$$\Rightarrow (x + 2)(x + 1) = 0$$

$$\Rightarrow x = -2, -1$$

Increasing and Decreasing Functions Ex 17.2 Q1(xi)

We have,

$$f(x) = 2x^3 - 9x^2 + 12x - 5$$

$$\therefore f'(x) = 6x^2 - 18x + 12$$

Critical points

$$f'(x) = 0$$

$$\Rightarrow 6(x^2 - 3x + 2) = 0$$

$$\Rightarrow (x - 2)(x - 1) = 0$$

$$\Rightarrow x = 2, 1$$

Clearly,  $f'(x) > 0$  if  $x < 1$  and  $x > 2$

$$f'(x) < 0 \text{ if } 1 < x < 2$$

Thus,  $f(x)$  increases in  $(-\infty, 1) \cup (2, \infty)$ , decreases in  $(1, 2)$ .

Increasing and Decreasing Functions Ex 17.2 Q1(xii)

We have,

$$f(x) = 6 + 12x + 3x^2 - 2x^3$$

$$\therefore f'(x) = 12 + 6x - 6x^2$$

Critical points

$$f'(x) = 0$$

$$\Rightarrow 6(2 + x - x^2) = 0$$

$$\Rightarrow (2 - x)(1 + x) = 0$$

$$\Rightarrow x = 2, -1$$

Clearly,  $f'(x) > 0$  if  $-1 < x < 2$

$$f'(x) < 0 \text{ if } x < -1 \text{ and } x > 2.$$

Thus,  $f(x)$  increases in  $(-1, 2)$ , decreases in  $(-\infty, -1) \cup (2, \infty)$ .

\*\*\*\*\* END \*\*\*\*\*