EXERCISE 29.2

PAGE NO: 29.18

Evaluate the following limits:

1. $\lim_{x\to 1} \frac{x^2+1}{x+1}$

Solution:

Given:

$\lim_{x\to 1} \frac{x^2+1}{x+1}$

Let us substitute the value of x directly in the given limit, we get

$\lim_{x\to 1} \frac{x^2+1}{x+1} = \frac{1^2+1}{1+1}$

$= 2/2$

$= 1$

∴ The value of the given limit is 1.

2. $\lim_{x\to 0} \frac{2x^2+3x+4}{x^2+3x+2}$

Solution:

Given:

$\lim_{x\to 0} \frac{2x^2+3x+4}{x^2+3x+2}$

Let us substitute the value of x directly in the given limit, we get

$\lim_{x\to 0} \frac{2x^2+3x+4}{x^2+3x+2} = \frac{2(0^2)+3(0)+4}{0^2+3(0)+2}$

$= 4/2$

$= 2$

∴ The value of the given limit is 2.

3. $\lim_{x\to 3} \frac{\sqrt{2x+3}}{x+3}$

Solution:

Given:

$$\lim_{x \to 3} \frac{\sqrt{2x+3}}{x+3}$$

Let us substitute the value of x directly in the given limit, we get

$$\lim_{x \to 3} \frac{\sqrt{2x+3}}{x+3} = \frac{\sqrt{2(3)+3}}{3+3}$$

$= \sqrt{9} / 6$

$= 3 / 6$

$= 1 / 2$

∴ The value of the given limit is 1/2.

4. $\lim_{x \to 1} \frac{\sqrt{x+8}}{\sqrt{x}}$

Solution:

Given:

$$\lim_{x \to 1} \frac{\sqrt{x+8}}{\sqrt{x}}$$

Let us substitute the value of x directly in the given limit, we get

$$\lim_{x \to 1} \frac{\sqrt{x+8}}{\sqrt{x}} = \frac{\sqrt{1+8}}{1}$$

$$= \frac{\sqrt{9}}{1}$$

$= 3$

∴ The value of the given limit is 3.

5. $\lim_{x\to a} \frac{\sqrt{x}+\sqrt{a}}{x+a}$

Solution:

Given:

$$\lim_{x\to a} \frac{\sqrt{x}+\sqrt{a}}{x+a}$$

Let us substitute the value of x directly in the given limit, we get

$$\lim_{x\to a} \frac{\sqrt{x}+\sqrt{a}}{x+a} = \frac{\sqrt{a}+\sqrt{a}}{a+a}$$

$$= \frac{2\sqrt{a}}{2a}$$

$$= \frac{1}{\sqrt{a}}$$

∴ The value of the given limit is $1/\sqrt{a}$.