CALCULUS 2: QUIZ SOLUTIONS

Question 1

Determine the value of $\lim_{x\to 3}(x+5)$, if it exists.

A. 8 B. 3 C. 2 D. Does not exist

Solution

$$\lim_{x\to 3}(x+5) = (3+5)$$
$$= 8$$

So, the correct answer is A.

Question 2

What is the value of $\lim_{x\to -1}(3x-1)$?

A. -2 B. -3 C. -4 D. Does not exist

Solution

$$\lim_{x\to -1}(3x-1) = 3(-1)-1$$
$$= -4$$

So, the correct answer is C

Question 3

What is the value of $\lim_{x\to 2}\left(\frac{x^2-4}{x-2}\right)$?

A. 0 B. 2 C. 4 D. Does not exist

Solution

$\lim_{x\to 2}\left(\frac{x^2-4}{x-2}\right) = \frac{2^2-4}{2-2} = \frac{0}{0}$, which is indeterminate.

So, factorise the numerator.

$$\therefore \lim_{x\to 2}\left(\frac{x^2-4}{x-2}\right) = \frac{(x-2)(x+2)}{(x-2)}$$
$$= \frac{\cancel{(x-2)}^{1}(x+2)}{\cancel{(x-2)}^{1}}$$
$$= 2+2$$
$$= 4$$

So, the correct answer is C.

Question 4

What is the value of $\lim_{x\to 1}\dfrac{x^2+x}{x-1}$?

A. 0 B. 1 C. 2 D. Does not exist

Solution

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

NB: $\dfrac{x^2+x}{x-1}=\dfrac{x(x+1)}{x-1}$

$$=\frac{2}{0}$$

which is undefined.

So, the correct answer is D.

Question 5

Determine the value of $\lim_{x\to -2}\left(\dfrac{x^2+3x+2}{x+2}\right)$.

A. -1 B. 0 C. 1 D. Does not exist

Solution

$$\lim_{x\to -2}\left(\frac{x^2+3x+2}{x+2}\right)=\left(\frac{(-2)^2+3(-2)+2}{-2+2}\right)$$

$$=\frac{4-6+2}{-2+2}$$

$$=\frac{0}{0}$$

which is indeterminate

So, factorise the numerator.

$$\therefore \lim_{x\to -2}\left(\frac{x^2+3x+2}{x+2}\right)=\frac{(x+2)(x+1)}{(x+2)}$$

$$=\frac{\cancel{(x+2)}^{1}(x+1)}{\cancel{(x+2)}^{1}}$$

$$=-2+1=-1$$

So, the correct answer is A.