the diagram shows part of the curve y=2-18/(2x+3), which crosses the x-axis at A and the y-axis at B.The normal to the curve at A crosses the y-axis at C.The normal to the curve at A crosses the y-axis at C.find the length of BC

Solution.

1.Find the coordinates of the point A.

Supposing y=0 from the equation of the curve we have

$$0=2-18/(2x+3) \Rightarrow 2=18/(2x+3) \Rightarrow 2(2x+3)=18 \Rightarrow x=3.$$

So , A(3,0).

2.Find the coordinates of the point B.

Supposing x=0 from the equation of the curve we have

$$y=2-18/3=-4.$$

So , B(0,-4).

3.Find the slope of the curve at the point A.

It is equal to the derivative of y(x) at this point. So,

$$y'(x)=36/(2x+6)^2$$

and $y'(3)=4/9$.

4.Through the point A draw a straight line perpendicular to the given curve.

An equation of this line is

$$y=-1/y'(3)*(x-3)$$

or

$$y=-9/4*x+27/4. \qquad (1)$$

5.Find the coordinates of the point C.

The point C is the point of intersection of the line (1) and y-axis. So, supposing in (1) x=0 we have y=27/4.So,the point C(0,27/4).

6.Find the length of BC.

As x-coordinates of the points B and C are equal the length of BC equals

$$BC=|y_B-y_C|=|-4-27/4|=43/4.$$

Answer: BC=27/4.