

MAC2311 Class Number 15498

QUIZ 3

1/31/2019

METHOD 2: DEGREE OF NUMERATOR IS 1 (SINCE $\sqrt{x^2} = |x|$) AND THE DEGREE OF THE DENOMINATOR IS 1, SO THE LIMIT IS THE RATIO OF LEADING COEFFICIENTS

Name: SOLUTIONS

1. Find the limit: $*\sqrt{x^2} = |x|$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{64x^2 - 3} + 7}{x + 3} = \lim_{x \rightarrow \infty} \frac{\sqrt{\frac{64x^2}{x^2} - \frac{3}{x^2}} + 7}{1 + \frac{3}{x}} = \lim_{x \rightarrow \infty} \frac{\sqrt{64} + 7}{1} = \frac{8 + 7}{1} = \boxed{15}$$

2. Find the average velocity of $s(t) = t^2 - 3t$ from $t = 2$ to $t = 2 + h$

$$s(t) = \frac{s(2+h) - s(2)}{2+h-2} = \frac{(2+h)^2 - 3(2+h) - (2^2 - 3(2))}{h} = \frac{4 + 4h + h^2 - 6 - 3h - (4 - 6)}{h} = \frac{h + h^2}{h} = \frac{h(1+h)}{h} = \boxed{1+h}$$

3. Compute the limit:

$$\lim_{x \rightarrow -1} \frac{-4 - \frac{4}{x}}{x+1} = \lim_{x \rightarrow -1} \frac{-4x - 4}{x(x+1)} = \lim_{x \rightarrow -1} \frac{-4(x+1)}{x(x+1)} = \frac{-4}{-1} = \boxed{4}$$