

İSTANBUL OKAN ÜNİVERSİTESİ MÜHENDİSLİK FAKÜLTESİ MÜHENDİSLİK TEMEL BİLİMLERİ BÖLÜMÜ

2018–19 Autumn

MATH115 Basic Mathematics – Homework 1 Solutions

N. Course

Circled exercises were chosen randomly using the "Integer Set Generator" feature on the website random.org. Nobody (teachers or students) knew which exercises would be marked until after the deadline had passed.



- (b) even
- (c) even
- (d) even
- (e) even

(2.)

(f) neither



(3.) (a) quotient

- (b) the root and product rules
- (c) the constant multiple and difference rules
- 4. (a) $\lim_{x \to 0} (2x 8)^{\frac{1}{3}} = \left(\lim_{x \to 0} 2x 8\right)^{\frac{1}{3}} = \left(2\lim_{x \to 0} x \lim_{x \to 0} 8\right)^{\frac{1}{3}} = (0 8)^{\frac{1}{3}} = -2$ by the root, difference and constant multiple rules.
 - (b) $\lim_{t \to -1} \frac{t^2 + 3t + 2}{t^2 t 2} = \lim_{t \to -1} \frac{(t+1)(t+2)}{(t+1)(t-2)} = \lim_{t \to -1} \frac{t+2}{t-2} = \frac{\lim_{t \to -1} (t+2)}{\lim_{t \to -1} (t-2)} = \frac{1}{-3} = -\frac{1}{3}$ by the quotient, sum and difference rules.
 - (c) $\lim_{v \to 9} \frac{4v v^2}{2 \sqrt{v}} = \frac{\lim_{v \to 9} (4v v^2)}{\lim_{v \to 9} (2 \sqrt{v})} = \frac{\lim_{v \to 9} (4v v^2)}{\lim_{v \to 9} (2 \sqrt{v})} = \frac{4(9) 9^2}{2 \sqrt{9}} = \frac{-45}{-1} = 45$ by the quotient, difference, constant multiple, power and root rules.

5. Since $\lim_{x\to 0} (x^4 - x^2 + 1) = 0 - 0 + 1 = 1$ and $\lim_{x\to 0} (2x^4 - 2x^2 + 10) = 0 - 0 + 1 = 1$, it follows by the Sandwich Theorem that $\lim_{x\to 0} g(x) = 1$ also.