[17]. Let $f(x) = \begin{cases} -5x+7 & \text{if } x < 3 \\ x^2 - 16 & \text{if } x \geq 3. \end{cases}$

Find $\lim_{x \to 3^+} f(x)$.

(a) 6 **(b)** -6 **(c)** -7 **(d)** -8 **(e)** The limit does not exist

[18]. Suppose $f(t) = \begin{cases} -t & \text{if } t < 1 \\ t^2 & \text{if } t \geq 1 \end{cases}$

Find the limit $\lim_{t \to 1} f(t)$.

(a) -1 **(b)** 1 **(c)** 0 **(d)** 2 **(e)** The limit does not exist

[19]. Suppose $f(t) = \begin{cases} (-t)^2 & \text{if } t < 1 \\ t^3 & \text{if } t \geq 1 \end{cases}$

Find the limit $\lim_{t \to 1} f(t)$.

(a) -2 **(b)** -1 **(c)** 1 **(d)** 2 **(e)** The limit does not exist

[20]. Suppose the total cost, $C(q)$, of producing a quantity q of a product equals a fixed cost of \$1000 plus \$3 times the quantity produced. So total cost in dollars is

$$C(q) = 1000 + 3q.$$

The average cost per unit quantity, $A(q)$, equals the total cost, $C(q)$, divided by the quantity produced, q. Find the limiting value of the average cost per unit as q tends to 0 from the right. In other words find

$$\lim_{q \to 0^+} A(q)$$

(a) 0 **(b)** 3 **(c)** 1000 **(d)** 1003 **(e)** The limit does not exist

Limits at infinity

[21]. Find the limit $\lim_{t \to \infty} \frac{3}{1+t^2}$.

(a) 0 **(b)** 1 **(c)** 2 **(d)** 3 **(e)** The limit does not exist

[22]. Find the limit $\lim_{x \to \infty} \frac{x^2+x+1}{(3x+2)^2}$.

(a) 1 **(b)** 1/3 **(c)** 0 **(d)** 1/9 **(e)** The limit does not exist

[23]. Find the limit $\lim_{s \to \infty} \frac{s^4+s^2+13}{s^3+8s+9}$.

(a) 0 **(b)** 1 **(c)** 2 **(d)** 3 **(e)** The limit does not exist

Answers

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[Limits at infinity]

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