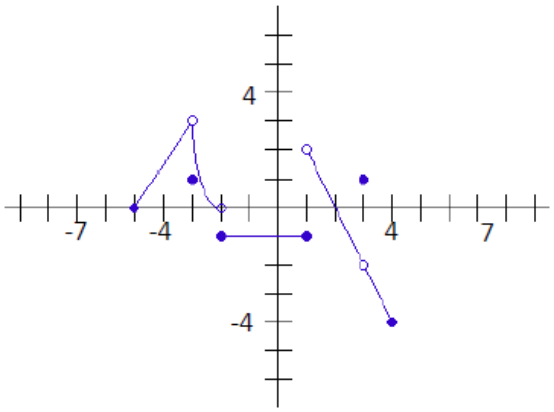
Limits for Practice

A. Now you try some!



Determine if the following limits exists:

1. $\lim_{x\to -3} f(x)$
2. $\lim_{x\to -2} f(x)$
3. $\lim_{x\to 0} f(x)$
4. $\lim_{x\to 1} f(x)$
5. $\lim_{x\to 2} f(x)$
6. $\lim_{x\to 3} f(x)$

Limits for Practice

Answers

A.

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

2. $\lim_{x\to -2} f(x)$
DNE ("Does not exist")

3. $\lim_{x\to 0} f(x) = -1$

4. $\lim_{x\to 1} f(x)$ DNE

5. $\lim_{x\to 2} f(x) = 0$

6. $\lim_{x\to 3} f(x) = -2$

Limits for Practice

B. Now you try some!

1. $\lim_{x \to c} (2x + 5)$
2. $\lim_{t \to 6} 8(t - 5)(t - 7)$
3. $\lim_{x \to 2} \frac{x+2}{x^2+5x+6}$

Limits for Practice

Answers

B.

1. 2c+5
2. -8
3. 1/5

Limits for Practice

C. Now you try some!

1. $\lim_{x\to -5} \frac{x^2+3x-5}{x+7}$

2. $\lim_{x\to 2} \frac{x+3}{x+6}$

Limits for Practice

Answers

C.

1. 5/2

2. 5/8

Limits for Practice

D. Now you try some!

a) $\lim_{x\to 5} \frac{2x^2-7x-15}{x-5}$

b) $\lim_{x\to 1} \frac{x^3-1}{x-1}$

Limits for Practice

Answers

D.

1. 13

2. 3

Limits for Practice

E. Now you try some!

1. $\lim_{x\to -2} \frac{x+2}{\sqrt{x+6}-2}$

2. $\lim_{x\to -1} \frac{\sqrt{x+10}-3}{x+1}$

Limits for Practice

Answers

E.

1. 4
2. 1/6

Limits for Practice

F. Now you try some!

1. $\lim_{x\to 0} \frac{sin\ 3x}{4x}$
2. $\lim_{x\to 1} \frac{5x^4-4x^2-1}{10-x-9x^3}$
3. $\lim_{x\to \infty} \frac{e^x}{x^3}$
4. $\lim_{x\to -\infty} x * lnx$
5. $\lim_{x\to \infty} x^{\frac{1}{x}}$
6. Why does the $\lim_{x\to -1} \frac{\sqrt{x+4}-3}{x+1}$ not equal $^1/_{2\sqrt{3}}$?
7. Early in their presentation of limits, most teachers present the following two limit facts as special cases: $\lim_{\theta\to 0} \frac{\sin\theta}{\theta} = 1$ and $\lim_{\theta\to 0} \frac{\cos\theta-1}{\theta} = 0$. Verify each by using L'Hôpital's Rule.

Limits for Practice

Answers

F.

1. 3/4
2. 3/7
3. ∞ (gets larger and larger without bound; technically this limit DNE)
4. DNE – cannot take the logarithm of negative values
5. 1
6. Upon substituting -1 into the numerator and denominator, we do not get one of the indeterminate forms; therefore we cannot use L'Hôpital's Rule. More advanced methods need to be used.

Limits for Practice

G. Now you try some!

1. $\lim_{x\to-\infty} \frac{2x^3-2x+5}{13x^3+x^2-5x+13}$
2. $\lim_{x\to+\infty} \frac{5x+1}{x^2-3x+4}$
3. $\lim_{x\to-\infty} \frac{2^x}{x^2}$
4. $\lim_{x\to+\infty} \frac{2^x}{x^2}$
5. $\lim_{x\to-\infty} -3x^3 + 2x^2 - 4x + 5$

Limits for Practice

Answers

G.

1. 2/13
2. 0
3. 0
4. $+\infty$
5. $+\infty$