WebAssign

Assignment #3: Chapter 2.2 (Homework)

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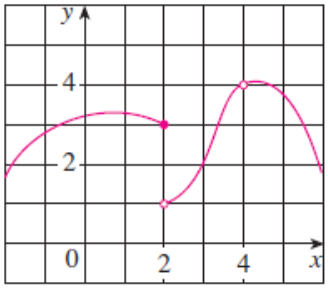
Math124A15, section F, Fall 2015
Instructor: Jonah Ostroff

Current Score : – / 54 **Due :** Tuesday, October 13 2015 11:58 PM PDT

1. –/6 pointsSCalcET7 2.2.004.

Use the given graph of f to state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{x \to 2^-} f(x)$

(b) $\lim_{x \to 2^+} f(x)$

(c) $\lim_{x \to 2} f(x)$

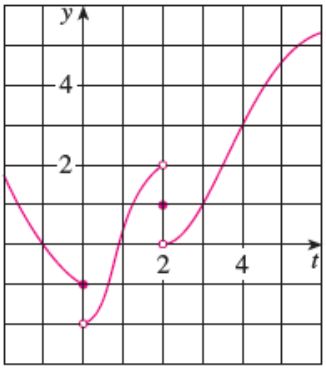
(d) $f(2)$

(e) $\lim_{x \to 4} f(x)$

(f) $f(4)$

2. –/8 pointsSCalcET7 2.2.007.

For the function g whose graph is given, state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{t \to 0^-} g(t)$

(b) $\lim_{t \to 0^+} g(t)$

(c) $\lim_{t \to 0} g(t)$

(d) $\lim_{t \to 2^-} g(t)$

(e) $\lim_{t \to 2^+} g(t)$

(f) $\lim_{t \to 2} g(t)$

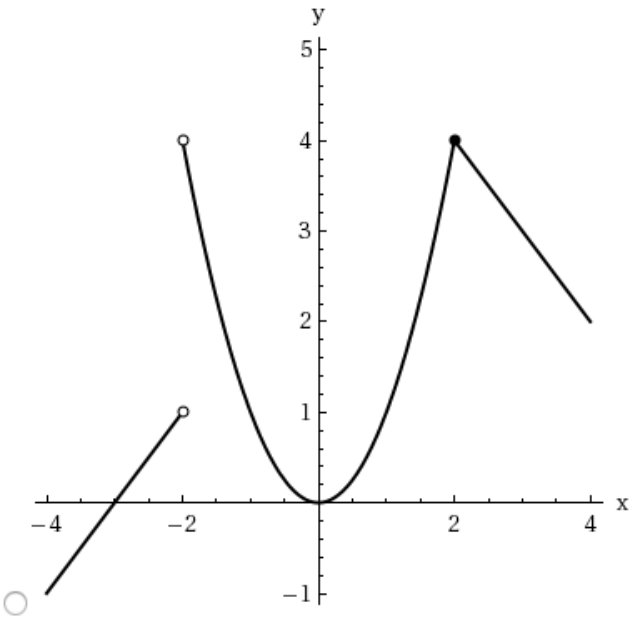
(g) $g(2)$

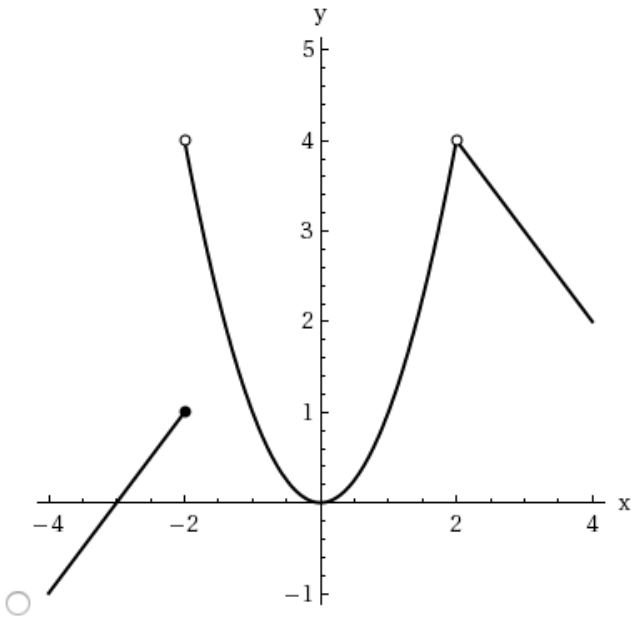
(h) $\lim_{t \to 4} g(t)$

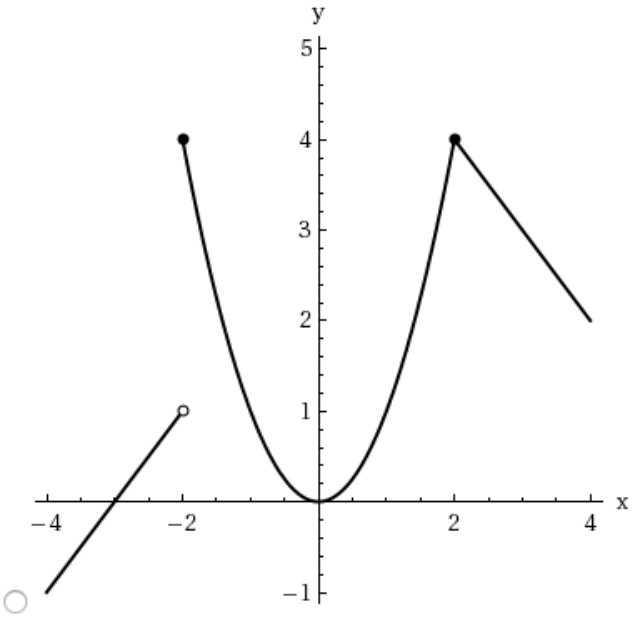
3. –/4 pointsSCalcET7 2.2.011.

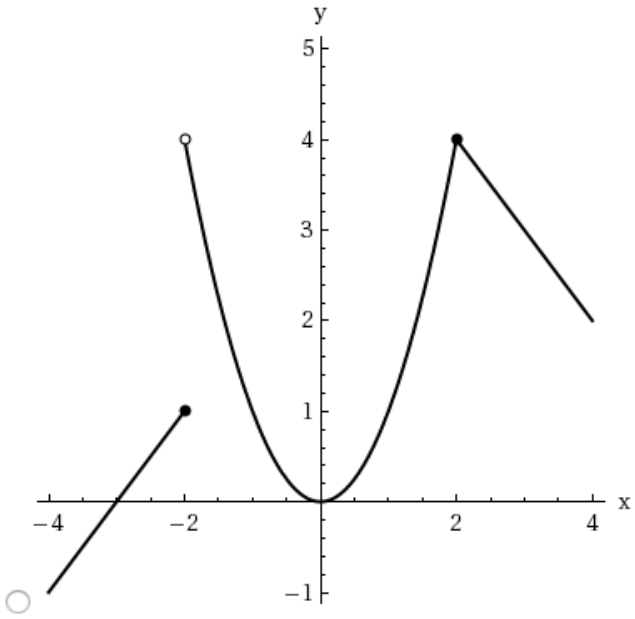
Sketch the graph of the function.

$$f(x) = \begin{cases} 3 + x & \text{if } x < -2 \\ x^2 & \text{if } -2 \le x < 2 \\ 6 - x & \text{if } x \ge 2 \end{cases}$$









Use the graph to determine the values of a for which $\lim_{x \to a} f(x)$ does not exist. (Enter your answers as a comma-separated list.)

$a =$

4. –/4 pointsSCalcET7 2.2.025.

Use a table of values to estimate the value of the limit. If you have a graphing device, use it to confirm your result graphically. (Round your answer to two decimal places.)

$$\lim_{x \to 1} \frac{x^7 - 1}{x^2 - 1}$$

5. –/4 pointsSCalcET7 2.2.031.

Determine the infinite limit.

$$\lim_{x \to 4} \frac{3 - x}{(x - 4)^2}$$

- ∞
- −∞

6. –/4 pointsSCalcET7 2.2.046.

In the theory of relativity, the mass of a particle with velocity v is

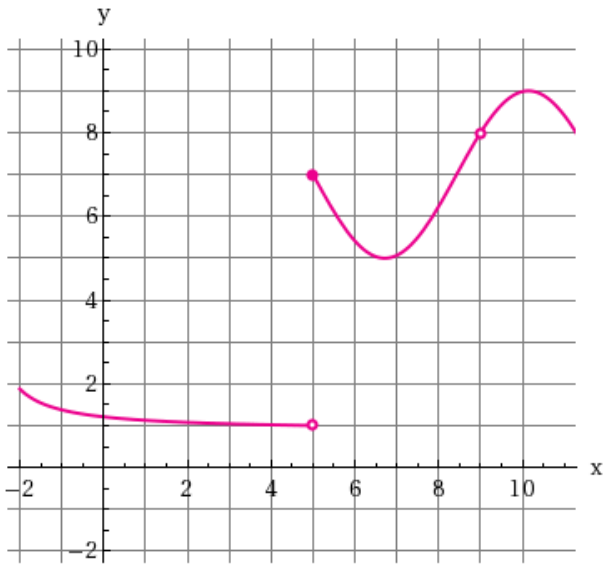
$$m = \frac{m_0}{\sqrt{1 - v^2/c^2}},$$

where m_0 is the mass of the particle at rest and c is the speed of light. What happens as $v \to c^-$?

- $m \to \infty$
- $m \to m_0$
- $m \to -\infty$
- $m \to 0$

7. –/5 pointsSCalcET7 2.2.503.XP.MI.

Use the given graph of f to state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{x \to 5^-} f(x)$

(b) $\lim_{x \to 5^+} f(x)$

(c) $\lim_{x \to 5} f(x)$

(d) $\lim_{x \to 9} f(x)$

(e) $f(9)$

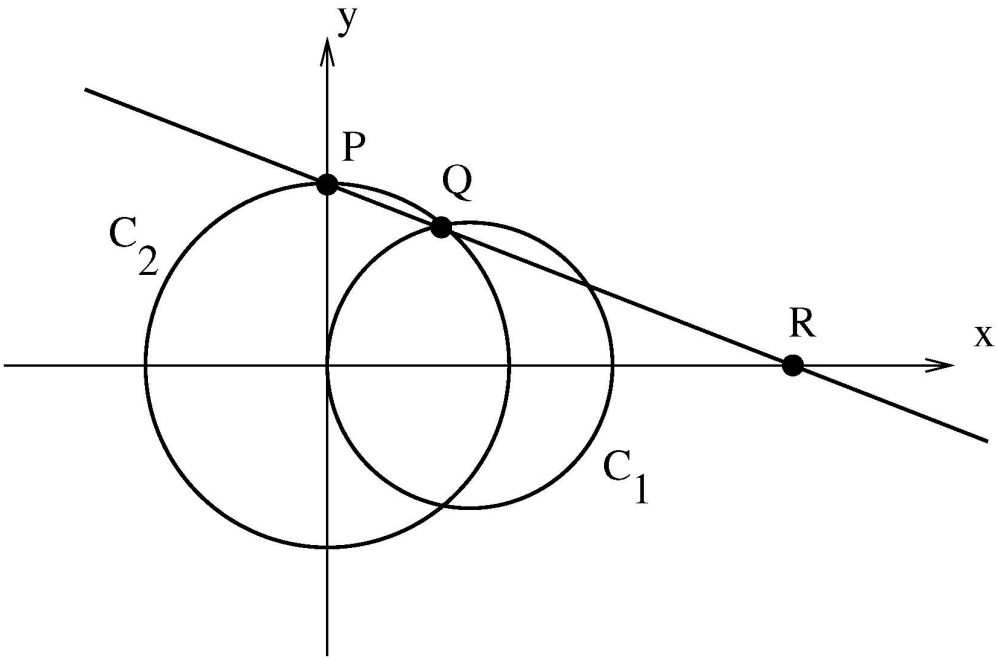
8. –/5 points

Consider $\lim_{t \to 0^+} \left(\frac{-2 \sin(2t)}{\sin(2t) + 2\, t \cos(2t)}\right)$. Using a table of values, the limiting value is

(Enter "DNE" if the limit does not exist.)

9. –/8 points

The figure below shows a fixed circle C_1 with equation $(x - 1)^2 + y^2 = 1$ and another shrinking circle C_2 centered at the origin with positive y-intercept $P=(0,r)$. Let Q be the point of intersection between the two circles pictured, draw a line through P and Q and let R be the x-intercept of that line.



(a) Find the coordinates of the point Q; your answers will involve r: $Q=$ (

,

).

(b) The line through P and Q has equation

y=

x +

.

(c) The point $R=$(

,

[ ]

).

(d) lim_(r->0)R = (

[ ]

[ ]

,

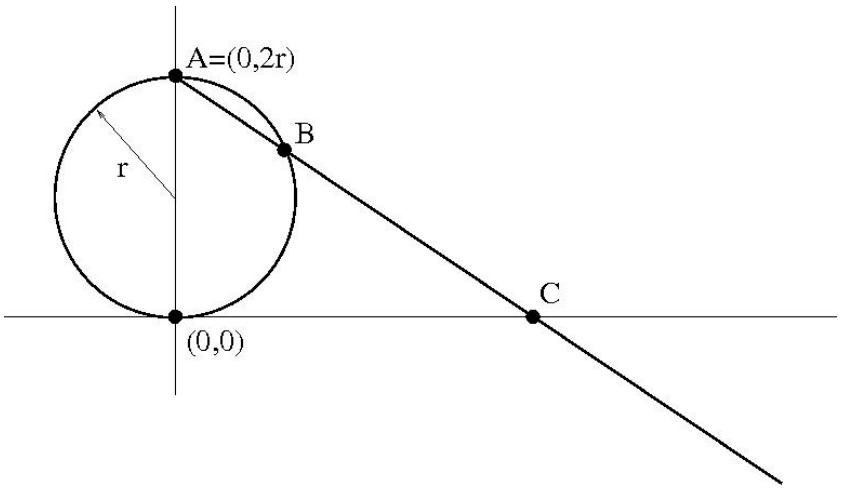
[ ]

[ ]

).

10.–/6 points

A circle of radius r centered at the point (0,r) in the plane will intersect the y-axis at the origin and the point A=(0,2r), as pictured below. A line passes through the point A and the point C=($4r^2$,0) on the x-axis. In this problem, we will investigate the coordinates of the intersection point B between the circle and the line, as r->infty



(a) The line through A and C has equation:

y=

x +

(b) The x-coordinate of the point B is

.

(c) The y-coordinate of the point B is

.

(d) The limit as r->infty of the x-coordinate of B is

(if your answer is infty, write infinity).

(e) The limit as r->infty of the y-coordinate of B is

(if your answer is infty, write infinity).