**Brian Petersen**

This set of WeBWorK problems covers limits and continuity, material in sections 1.5 and 1.6 of Brief Calculus. WeBWorK assignment Set2 is due on 09/25/2012 at 10:00pm EDT.

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**1.** (1 pt) Find the equation of the line tangent to the curve

$$y = 11x^2 - 8x + 11$$

at the point

$$(2, 39).$$

(A line is tangent to a curve at a point if it passes through that point and the line and the curve have the same slope at that point. Although it is more natural to use the point-slope form, this question asks for the slope-intercept form.)

$y =$_____

*Answer(s) submitted:*

- `36(x-2)+39`

(correct)

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**2.** (1 pt) Find the slope of the curve $y = 3x^3 - 5x^2$ at the point $(1, -2)$.

$m =$_____

*Answer(s) submitted:*

- `-1`

(correct)

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**3.** (1 pt) For what values of x does the curve $y = x^2 - 2x + 3$ have:

Positive slope? _____

Negative slope? _____

Zero slope? x=_____

Your answer to parts 1 and 2 should be an interval $(a, b)$. Use INF for $+\infty$, -INF for $-\infty$.

*Answer(s) submitted:*

- `(1, INF)`
- `(-INF,1)`
- `1`

(correct)

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**4.** (1 pt) If $f(x) = (7x^2 - 3)(7x + 3)$, find $f'(x)$.

_____

[NOTE: Your answer should be a function in terms of the variable 'x' and not a number! ]

*Answer(s) submitted:*

- `14x(7x+3)+7(7x^2-3)`

(correct)

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**5.** (1 pt) Find the $x$ coordinate of the point on the curve $y = x + 9x^{-1}, x > 0$ where the tangent line has slope -3.

$x =$_____

*Answer(s) submitted:*

- `3/2`

(correct)

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**6.** (1 pt) Find the values of x at which the curve given by the equation

$$\frac{1}{3}x^3 - 1.5x^2 + 2x + 2$$

has a horizontal tangent line. Write your answers in increasing order.

$x =$_____, _____

*Answer(s) submitted:*

- `1`
- `2`

(correct)

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**7.** (1 pt) Find the $x$ coordinate of the point on the curve $y = 9x^2 + 8x + 10$ where the tangent line is perpendicular to the line $x + 4y = 8$. (A line is tangent to a curve at a point if the line and the curve have the same slope at that point, and the line passes through that point.)

x=_____

*Answer(s) submitted:*

- `-4/18`

(correct)

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**8.** (1 pt) A car traveling at 50 ft/sec decelerates at a constant 8 ft/sec/sec. How many feet does the car travel before coming to a complete stop?

_____

*Answer(s) submitted:*

- `-4((50/8)^2) + 50(50/8)`

(correct)

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**9.** (1 pt) A ball is thrown straight up so its height t seconds later is $-16t^2 + 32t + 6$.

a. Find the velocity of the ball at t seconds after it is thrown.

_____

b. At what time does the ball reach its maximum height?

t=_____

c. Find the acceleration of the ball at any time t.

a=_____

*Answer(s) submitted:*

- `-32t+32`
- `1`
- `-32`

(correct)

**10.** (1 pt) Find the equation of the tangent line to the curve $y = (x+1)(x^2-1)$ at the point (1,0).

$y =$_____

*Answer(s) submitted:*

- `(((1)(1^2-1))+((1+1)(2(1))))(x-1)`

(correct)

**11.** (1 pt) If

$$f(x) = \frac{\sqrt{x}-7}{\sqrt{x}+7}$$

find $f'(x)$.

_____

Find $f'(5)$.

_____

*Answer(s) submitted:*

- `(((.5x^-.5)(sqrt(x)+7))-(sqrt(x)-7)(.5x^-.5))/((sqrt(x)+7)^2)`
- `(((.5(5)^-.5)(sqrt(5)+7))-(sqrt(5)-7)(.5(5)^-.5))/((sqrt(5)+7)^2)`

(correct)

**12.** (1 pt) If $f(x) = \frac{7x+8}{3x+2}$, find $f'(x)$.

_____

Find $f'(4)$.

_____

*Answer(s) submitted:*

- `(((7)(3x+2))-((7x+8)(3)))/((3x+2)^2)`
- `(((7)(3(4)+2))-((7(4)+8)(3)))/((3(4)+2)^2)`

(correct)

**13.** (1 pt) A traveler is moving from left to right along the curve $y = x^2$. When she shuts off the engines, she will continue traveling along the tangent line at the point where she is at that time. At what point should she cut off the engines in order to reach the point (3.5,10)?

x=_____

*Answer(s) submitted:*

- 2

(correct)