

## EMCF 08

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1. Give the slope of the tangent line to the graph of  $f(x) = 3x^3 + 4x^2 - 8x - 1$  at the point where  $x = -1$ .
  - a. 13
  - b. 14
  - c. 15
  - d. 16
  - e. 17
  - f. None of these.
2. Give the slope of the tangent line to the graph of  $f(x) = -3x^3 - \frac{1}{2}x^4 + 12x$  at the point where  $x = -1$ .
  - a. 1
  - b. 2
  - c. 3
  - d. DNE
  - e. 4
  - f. None of these.
3. Give the slope of the **normal line** to the graph of  $f(x) = 3x^3 - 4x^2 + 2x - 1$  at the point where  $x = -1$ .
  - a.  $-1/13$
  - b.  $-1/14$
  - c.  $-1/15$
  - d.  $-1/16$
  - e.  $-1/17$
  - f. None of these.
4. Give the slope of the **normal line** to the graph of  $f(x) = 2x^3 - x^4$  at the point where  $x = 1$ .
  - a. -1
  - b.  $-1/2$
  - c. DNE
  - d.  $-1/3$
  - e.  $-1/4$
  - f. None of these.

5. Give the derivative of  $f(x) = 4\sqrt{x} - x^4$ .

a.  $f'(x) = \frac{2}{\sqrt{x}} - 4x^3$

b.  $f'(x) = \frac{1}{\sqrt{x}} - 4x^3$

c.  $f'(x) = \frac{2}{\sqrt{x}} - 4x^2$

d.  $f'(x) = \frac{1}{\sqrt{x}} - 4x^2$

e.  $f'(x) = 2 - 4x$

f. None of these.

6. Give the derivative of  $f(x) = \frac{2x-3}{x^2-1}$  at  $x = 2$ .

a. 1/9

b. -1/9

c. 2/9

d. -2/9

e. 0

f. None of these.

7. Let  $f(x) = \frac{2x-3}{x^2-1}$ . Give  $f'(2)$ .

a. 1/9

b. -1/9

c. 2/9

d. -2/9

e. 0

f. None of these.

8. Give a value of  $A$  so that the function  $f(x) = \begin{cases} x - x^2, & x < 2 \\ x^2 - Ax, & x \geq 2 \end{cases}$

is continuous.

a. 1

b. 0

c. There is no such value.

d. 2

e. 3

f. None of these.

9. Give the value  $x$  where the function  $f(x) = \frac{x^2 - 2x - 3}{x^2 - 1}$  has an infinite discontinuity.

- a. 1
- b. -1
- c. There is no such value.
- d. 0
- e. 2
- f. None of these.

10. Let  $f(x) = 3x^2 - 2x^3$ . Give the value of  $\lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h}$ .

- a. 0
- b. 1
- c. 2
- d. DNE
- e. 3
- f. None of these.