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QUESTION 1

Drag and drop the correct answer into the space(s) provided.

Find the equation of the tangent to the graph of

$f(x) = 3x^2 + 4x - 1$

at

$x = 4$

.

Use the power rule and other rules of derivatives to find the dervative of

$f(x) = 3x^2 + 4x - 1$

.

$f'(x) =$

$6x + 4$ ✓

Evaluate the derivative at

$x = 4$

.

$f'(4) =$

28 ✓

Evaluate the function at

$x = 4$

.

$f(4) =$

63 ✓

An equation for the tangent line to the graph of

$f(x) = 3x^2 + 4x - 1$

at

$x = 4$

is

$y =$

$28(x-4)+63$ ✓.

$28(x-4)+27$ | 31 | $28(x-4)+31$

$16(x-4)+31$ | 16 | $3x+4$ | $16(x-4)+63$

$16(x-4)+27$ | 27

QUESTION 2

Drag and drop the correct answer into the space(s) provided.

Find the following derivatives of the function

$f(x) = 7x^4 + 4x^3 - 6x^2 + 9x - 17$

.

$f'(x) =$

$28x^3 + 12x^2 - 12x + 9$ ✓

$f''(x) =$

$84x^2 + 24x - 12$ ✓

$f'''(x) =$

$168x + 24$ ✓

$f^{(4)}(x) =$

168 ✓

$f^{(5)}(x) =$

0 ✓

$24x + 6$ $12x^2 + 6x - 2$ 24

$4x^3 + 3x^2 - 2x + 9$

QUESTION 3

Drag and drop the correct answer into the space(s) provided.

Find the following derivatives of the function

$f(x) = 5x^5 - 3x^4 + 7x^3 - 1$

.

$f'(x) =$

$25x^4 - 12x^3 + 21x^2$ ✓

$f''(x) =$

$100x^3 - 36x^2 + 42x$ ✓

$f'''(x) =$

$300x^2 - 72x + 42$ ✓

$f^{(4)}(x) =$

$600x - 72$ ✓

$f^{(5)}(x) =$

600 ✓

$f^{(6)}(x) =$

0 ✓

$20x^3 - 12x^2 + 6x$ | 120 | $5x^4 - 4x^3 + 3x^2$

$120x - 24$ | $60x^2 - 24x + 6$

QUESTION 4

Drag and drop the correct answer into the space(s) provided.

Find the following derivatives of the function

$f(x) = 2x^6 - 4x^4 + 8x^2 + 5$

.

$f'(x) =$

$12x^5 - 16x^3 + 16x$ ✓

$f''(x) =$

$60x^4 - 48x^2 + 16$ ✓

$f'''(x) =$

$240x^3 - 96x$ ✓

$f^{(4)}(x) =$

$720x^2 - 96$ ✓

$f^{(5)}(x) =$

$1440x$ ✓

$f^{(6)}(x) =$

1440 ✓

$f^{(7)}(x) =$

0 ✓

$360x^2 - 24$ $120x^3 - 24x$ $720x$ 720

$30x^4 - 12x^2 + 2$ $6x^5 - 4x^3 + 2x$

QUESTION 5

Drag and drop the correct answer into the space(s) provided.

Find the equation of the tangent to the graph of

$f(x) = 6x^2 - 5x + 4$

at

$x = 5$

.

Use the power rule and other rules of derivatives to find the dervative of

$f(x) = 6x^2 - 5x + 4$

.

$f'(x) =$

$12x - 5$ ✓

Evaluate the derivative at

$x = 5$

.

$f'(5) =$

55 ✓

Evaluate the function at

$x = 5$

.

$f(5) =$

129 ✓

An equation for the tangent line to the graph of

$f(x) = 6x^2 - 5x + 4$

at

$x = 5$

is

$y =$

$55(x-5)+129$ ✓

.

$25(x-5)+129$ | 125 | $55(x-5)+125$

$25(x-5)+154$ | $25(x-5)+125$ | 154 | 25

$55(x-5)+154$ | $6x-5$

QUESTION 6

Fill in the blank(s) with the correct answer.

Find the equation of the tangent to the graph of

$$f(x)=x^2-6+\frac{8}{x}$$

at

$x=1$

.

The equation of the tangent line at

$x=1$

:

$y=$

-6 ✓

$(x-$

1 ✓

)+

3 ✓

QUESTION 7

Fill in the blank(s) with the correct answer.

Find the equation of the tangent to the graph of

$$f(x) = x^3 - 7 + \frac{12}{x}$$

at

$x = 2$

.

The equation of the tangent line at

$x = 2$

:

$y =$

9 ✓

$(x -$

2 ✓

)+

7 ✓

QUESTION 8

Fill in the blank(s) with the correct answer.

The position of a race car

t

seconds after it finishes the first loop is given by

$f(t) = 36t + 9.5t^2$

meters. Find the acceleration of the car at time

t

.

The acceleration of the car as it finishes the first loop is 19 ✓

meters per second squared.

QUESTION 9

Fill in the blank(s) with the correct answer.

The position of a cyclist

t

seconds after finishing the race is given by

$f(t) = 4t - 0.8t^2$

meters. Find the acceleration of the cyclist at time

t

.

The acceleration of the cyclist after finishing the race is -1.6 ✓

meters per second squared.

QUESTION 10

Fill in the blank(s) with the correct answer.

The height of a toy rocket

t

seconds after it is launched is given by

$f(t) = 3 + 12\,t - 4.9\,t^2$

meters. Find the acceleration of the rocket at time

t

.

The acceleration of the rocket after it is launched is -9.8 ✓

meters per second squared.

QUESTION 11

Choose the correct answer from the drop-down menu.

What is the third derivative of the function

$f(x) = 9\,x^5 - \frac{7}{x^2} + \sqrt{x}$

?

$f'''(x) =$

$540\,x^{2} + 168\,x^{-5} + \frac{3}{8}\,x^{-\frac{5}{2}}$ ✓

QUESTION 12

Choose the correct answer from the drop-down menu.

What is the third derivative of the function

$$f(x) = \frac{5}{x^{3}} + 6\sqrt[3]{x^{4}}$$

?

$f'''(x) =$

$-300\,x^{-6} - \frac{16}{9}\,x^{-\frac{5}{3}}$ ✓

QUESTION 13

Choose the correct answer from the drop-down menu.

What is the fourth derivative of the function

$$f(x) = 10\,x^{4} - \frac{7}{x} + 2\sqrt{x}$$

?

$f^{(4)}(x) =$

$240 - 168\,x^{-5} - \frac{15}{8}\,x^{-\frac{7}{2}}$ ✓

QUESTION 14

Select the correct option.

What is an equation of the tangent to the graph of

$f(x) = 3x - \frac{4}{x}$

at

$x = -2$

?

- ○ $y = 4(x + 2) - 8$
- ✓ $y = 4(x + 2) - 4$
- ○ $y = -7(x + 2) - 8$
- ○ $y = -7(x + 2) - 4$

QUESTION 15

Select the correct option.

What is an equation of the tangent to the graph of

$$f(x) = 8x - \frac{5}{x}$$

at

$$x = -1$$

?

- [x] $y = 13(x + 1) - 3$
- [ ] $y = 13(x + 1) + 3$
- [ ] $y = -13(x + 1) - 13$
- [ ] $y = -3(x + 1) - 13$