

**Determine higher-order derivatives****1**Find the derivative $f'(x)$.

if $f(x) = c$, $f'(x) = 0$

$[12pt] f(x) = \frac{3}{4}$

A $f'(x) = 1$

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

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

D $f'(x) = 0$

3Find the derivative $f'(x)$ using the power rule.

if $f(x) = ax^n$, $f'(x) = anx^{n-1}$

$[12pt] f(x) = -5x^4$

A $f'(x) = -20x^3$

B $f'(x) = -20x^4$

C $f'(x) = -5x^3$

D $f'(x) = -20x^5$

2Find the derivative $f'(x)$ using the power rule.

if $f(x) = x^n$, $f'(x) = nx^{n-1}$

$[12pt] f(x) = x^6$

A $f'(x) = 6x^7$

B $f'(x) = 6x^5$

C $f'(x) = x^5$

D $f'(x) = 6x^6$

4Find the derivative $f'(x)$ using the sum rule.

$f(x) = 2x^2 - 5x^3$

A $f'(x) = 2x - 5x^2$

B $f'(x) = 4x - 15x^2$

C $f'(x) = 4x^2 - 15x^3$

5Find the derivative $f'(x)$ using the natural exponential rule and the chain rule.

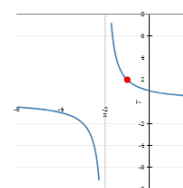
$\frac{d}{dx}e^u = e^u \cdot \frac{du}{dx}$

$[12pt] f(x) = e^x$

A $f'(x) = (x)e^{x-1}$

B $f'(x) = e^x \cdot (x)$

C $f'(x) = e^x$

6At the highlighted point, what are the signs of $f'(x)$ and $f''(x)$?A $f'(x)$ positive,
 $f''(x)$ positiveB $f'(x)$ positive,
 $f''(x)$ zeroC $f'(x)$ positive,
 $f''(x)$ negativeD $f'(x)$ negative,
 $f''(x)$ positive

**Determine higher-order derivatives****7**

On the interval $(1, \infty)$, is the concavity positive or negative?

$$f(x) = 2x^3 - 6x + 3$$

A Positive

B Can't be determined

C Negative

8

On the interval $(0, \infty)$, is the concavity positive or negative?

$$f(x) = -2x^3 - 6x^2 + 2$$

A Positive

B Can't be determined

C Negative

9

On the interval $(-2, -1)$, is the concavity positive or negative?

$$f(x) = 2x^3 + 6x^2 + 2$$

A Negative

B Positive

C Can't be determined

10

On the interval $(0, \infty)$, is the concavity positive or negative?

$$f(x) = 2x^3 + 12x^2 + 3$$

A Negative

B Can't be determined

C Positive

11

On the interval $(-3, -2)$, is the concavity positive or negative?

$$f(x) = 2x^3 + 12x^2 + 18x - 1$$

A Can't be determined

B Positive

C Negative

12

On the interval $(-2, -1)$, is the concavity positive or negative?

$$f(x) = 2x^3 + 6x^2 - 3$$

A Positive

B Can't be determined

C Negative