Name_____

Calculus Practice: Derivatives of Functions 1a

For each problem, find the derivative of the function at the given value.

1) $f(x) = \dfrac{x^2}{2} + 3x + \dfrac{7}{2}$ at $x = -1$

   A) $f'(-1) = -1$
   B) $f'(-1) = -2$
   C) $f'(-1) = 2$
   D) $f'(-1) = 1$

2) $f(x) = -\dfrac{x^2}{2} - x + \dfrac{3}{2}$ at $x = -5$

   A) $f'(-5) = 4$
   B) $f'(-5) = -3$
   C) $f'(-5) = -7$
   D) $f'(-5) = -5$

3) $f(x) = -x^3 + 4x^2 - 6$ at $x = 3$

   A) $f'(3) = -3$ B) $f'(3) = -28$
   C) $f'(3) = 4$ D) $f'(3) = -35$

4) $f(x) = x^3 + 7x^2 + 15x + 9$ at $x = -2$

   A) $f'(-2) = 20$
   B) $f'(-2) = 160$
   C) $f'(-2) = -1$
   D) $f'(-2) = 4$

5) $f(x) = -\dfrac{2}{x^2 - 4}$ at $x = -4$

   A) $f'(-4) = -\dfrac{1}{9}$

   B) $f'(-4) = -\dfrac{3}{128}$

   C) $f'(-4) = -\dfrac{4}{9}$

   D) $f'(-4) = -\dfrac{12}{25}$

6) $f(x) = -\dfrac{x^2}{4x + 4}$ at $x = -2$

   A) $f'(-2) = -\dfrac{3}{16}$

   B) $f'(-2) = -\dfrac{15}{64}$

   C) $f'(-2) = -\dfrac{6}{25}$

   D) $f'(-2) = 0$

7) $f(x) = (x + 4)^{\frac{2}{3}}$ at $x = 4$

   A) $f'(4) = -\dfrac{2}{3}$

   B) $f'(4) = \dfrac{\sqrt[3]{36}}{9}$

   C) $f'(4) = \dfrac{1}{3}$

   D) $f'(4) = \dfrac{2}{3}$

8) $f(x) = -(-x + 1)^{\frac{1}{2}}$ at $x = -1$

   A) $f'(-1) = \dfrac{\sqrt{3}}{6}$

   B) $f'(-1) = \dfrac{1}{4}$

   C) $f'(-1) = \dfrac{1}{2}$

   D) $f'(-1) = \dfrac{\sqrt{2}}{4}$

9) $f(x) = -(2x + 8)^{\frac{1}{2}}$ at $x = -2$

A) $f'(-2) = -\dfrac{\sqrt{2}}{2}$

B) $f'(-2) = -\dfrac{\sqrt{6}}{6}$

C) $f'(-2) = -\dfrac{\sqrt{3}}{6}$

D) $f'(-2) = -\dfrac{1}{2}$

10) $f(x) = (4x + 12)^{\frac{1}{2}}$ at $x = 4$

A) $f'(4) = \dfrac{1}{2}$

B) $f'(4) = \dfrac{\sqrt{7}}{7}$

C) $f'(4) = \dfrac{1}{3}$

D) $f'(4) = 1$

11) $f(x) = e^{x+2}$ at $x = -3$

A) $f'(-3) = \dfrac{1}{e}$

B) $f'(-3) = e$

C) $f'(-3) = \dfrac{1}{e^2}$

D) $f'(-3) = e^2$

12) $f(x) = -\ln(x + 2)$ at $x = -1$

A) $f'(-1) = -\dfrac{1}{2}$

B) $f'(-1) = 1$

C) $f'(-1) = -1$

D) $f'(-1) = -3$

13) $f(x) = e^{x-3}$ at $x = 1$

A) $f'(1) = \dfrac{1}{e^2}$

B) $f'(1) = e^2$

C) $f'(1) = e$

D) $f'(1) = \dfrac{1}{e}$

14) $f(x) = -\ln(-x + 1)$ at $x = -3$

A) $f'(-3) = \dfrac{1}{3}$

B) $f'(-3) = \dfrac{1}{4}$

C) $f'(-3) = -2$

D) $f'(-3) = 1$

15) $f(x) = 2\csc(x)$ at $x = -\dfrac{5\pi}{6}$

A) $f'\left(-\dfrac{5\pi}{6}\right) = 4\sqrt{3}$

B) $f'\left(-\dfrac{5\pi}{6}\right) = 0$

C) $f'\left(-\dfrac{5\pi}{6}\right) = 2\sqrt{2}$

D) $f'\left(-\dfrac{5\pi}{6}\right) = -2\sqrt{2}$

16) $f(x) = \csc(2x)$ at $x = -\dfrac{2\pi}{3}$

A) $f'\left(-\dfrac{2\pi}{3}\right) = -2$

B) $f'\left(-\dfrac{2\pi}{3}\right) = 0$

C) $f'\left(-\dfrac{2\pi}{3}\right) = \dfrac{4}{3}$

D) $f'\left(-\dfrac{2\pi}{3}\right) = -1$

17) $f(x) = 2\tan(x)$ at $x = -\dfrac{\pi}{6}$

A) $f'\left(-\dfrac{\pi}{6}\right) = \dfrac{8}{3}$

B) $f'\left(-\dfrac{\pi}{6}\right) = 4$

C) $f'\left(-\dfrac{\pi}{6}\right) = 0$

D) $f'\left(-\dfrac{\pi}{6}\right) = 2$

18) $f(x) = \cot(x)$ at $x = \dfrac{\pi}{4}$

A) $f'\left(\dfrac{\pi}{4}\right) = 3$

B) $f'\left(\dfrac{\pi}{4}\right) = 1$

C) $f'\left(\dfrac{\pi}{4}\right) = -2$

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