Calculus Practice: Using Differentiation to Find a Tangent 2a

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

1) $y = e^{x-2}$ at $\left(1, \frac{1}{e}\right)$

A) $y = \frac{1}{e} \cdot x$

B) $y = \frac{1}{e^2} \cdot x + \frac{1}{e^2}$

C) $y = e^2x - 3e^2$

D) $y = ex - 2e$

2) $y = -e^{x-2}$ at $\left(1, -\frac{1}{e}\right)$

A) $y = -e^2x + 3e^2$

B) $y = -ex + 2e$

C) $y = -\frac{1}{e^2} \cdot x - \frac{1}{e^2}$

D) $y = -\frac{1}{e} \cdot x$

3) $y = -\ln(-x + 3)$ at $(2, 0)$

A) $y = -2x + 3$

B) $y = x - 2$

C) $y = \frac{1}{2}x + \frac{-2\ln 2 - 1}{2}$

D) $y = -2x + 1$

4) $f(x) = \ln(-x)$ at $(-1, 0)$

A) $y = -3x - 2$

B) $y = -\frac{1}{2}x + \ln 2 - 1$

C) $y = -x + 1$

D) $y = -x - 1$

5) $y = \ln(-x + 3)$ at $(2, 0)$

A) $y = -x - 1$

B) $y = -x + 2$

C) $y = x - 2$

D) $y = -\frac{1}{2}x + \frac{2\ln 2 + 1}{2}$

6) $f(x) = -\ln(x + 1)$ at $(0, 0)$

A) $y = -\frac{1}{2}x + \frac{-2\ln 2 + 1}{2}$

B) $y = -x + 1$

C) $y = -x$

D) $y = -3x + 3$

7) $f(x) = -\ln(x + 3)$ at $(5, -\ln 8)$

A) $y = -\frac{1}{4}x + \frac{-4\ln 4 + 1}{4}$

B) $y = -\frac{1}{7}x + \frac{-7\ln 7 + 4}{7}$

C) $y = -\frac{1}{8}x + \frac{-8\ln 8 + 5}{8}$

D) $y = -\frac{1}{5}x + \frac{-5\ln 5 + 2}{5}$

8) $y = e^{-x-1}$ at $(-2, e)$

A) $y = -ex - e$

B) $y = -e^2x - 2e^2$

C) $y = -\frac{1}{e} \cdot x + \frac{1}{e}$

D) $y = -\frac{1}{e^2} \cdot x + \frac{2}{e^2}$

9) $f(x) = \tan(x)$ at $\left(-\frac{\pi}{6}, -\frac{\sqrt{3}}{3}\right)$

A) $y = 2x + \frac{-2 - 3\pi}{2}$

B) $y = \frac{4}{3}x + \frac{-3\sqrt{3} + 2\pi}{9}$

C) $y = 2x + \frac{2 - 5\pi}{2}$

D) $y = x$

10) $f(x) = -2\sec(x)$ at $(-\pi, 2)$

A) $y = -2\sqrt{2} \cdot x + \frac{4\sqrt{2} + 3\pi\sqrt{2}}{2}$

B) $y = -2$

C) $y = -2\sqrt{2} \cdot x + \frac{-4\sqrt{2} + \pi\sqrt{2}}{2}$

D) $y = 2$

11) $y = \cos(x)$ at $\left(-\frac{\pi}{2}, 0\right)$

A) $y = -1$

B) $y = -x + \frac{\pi}{2}$

C) $y = x + \frac{\pi}{2}$

D) $y = \frac{\sqrt{2}}{2}x + \frac{4\sqrt{2} - 7\pi\sqrt{2}}{8}$

12) $f(x) = -\sec(x)$ at $(\pi, 1)$

A) $y = -\sqrt{2} \cdot x + \frac{4\sqrt{2} + 3\pi\sqrt{2}}{4}$

B) $y = -1$

C) $y = 1$

D) $y = \sqrt{2} \cdot x + \frac{4\sqrt{2} - 5\pi\sqrt{2}}{4}$

13) $f(x) = 2\sec(x)$ at $(-\pi, -2)$

A) $y = -2\sqrt{2} \cdot x + \frac{4\sqrt{2} + 7\pi\sqrt{2}}{2}$

B) $y = 2$

C) $y = 2\sqrt{2} \cdot x + \frac{4\sqrt{2} - \pi\sqrt{2}}{2}$

D) $y = -2$

14) $y = \sin(x)$ at $\left(\frac{\pi}{2}, 1\right)$

A) $y = -x + \pi$

B) $y = -\frac{\sqrt{2}}{2}x + \frac{-4\sqrt{2} + 5\pi\sqrt{2}}{8}$

C) $y = 1$

D) $y = \frac{\sqrt{2}}{2}x + \frac{-4\sqrt{2} - 7\pi\sqrt{2}}{8}$

15) $f(x) = -2\tan(x)$ at $\left(-\frac{\pi}{6}, \frac{2\sqrt{3}}{3}\right)$

A) $y = -4x + 2 + 7\pi$

B) $y = -\frac{8}{3}x + \frac{6\sqrt{3} - 4\pi}{9}$

C) $y = -2x + 4\pi$

D) $y = -2x + 2\pi$

16) $y = -\tan(2x)$ at $(\pi, 0)$

A) $y = -2x + 3\pi$

B) $y = -2x + 2\pi$

C) $y = -2x + \pi$

D) $y = -2x$

17) $y = 2\cot(2x)$ at $\left(\frac{\pi}{4}, 0\right)$

A) $y = -4x + 3\pi$

B) $y = -4x + 5\pi$

C) $y = -4x + 7\pi$

D) $y = -4x + \pi$

18) $f(x) = 2\sec(2x)$ at $\left(-\frac{\pi}{2}, -2\right)$

A) $y = -2x + 1$

B) $y = -3x + 2$

C) $y = -2$

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9) $f(x) = \tan(x)$ at $\left(-\frac{\pi}{6}, -\frac{\sqrt{3}}{3}\right)$

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13) $f(x) = 2\sec(x)$ at $(-\pi, -2)$

A) $y = -2\sqrt{2} \cdot x + \frac{4\sqrt{2} + 7\pi\sqrt{2}}{2}$

B) $y = 2$

C) $y = 2\sqrt{2} \cdot x + \frac{4\sqrt{2} - \pi\sqrt{2}}{2}$

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