Name_____

Calculus Practice: Using Differentiation to Find a Tangent 1b

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) $f(x) = x^2 + 2x + 1$ at $(-2, 1)$

2) $f(x) = \dfrac{x^2}{2} + 2x - 3$ at $\left(-1, -\dfrac{9}{2}\right)$

3) $y = -\dfrac{x^2}{2} + 4x - 6$ at $\left(5, \dfrac{3}{2}\right)$

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

5) $f(x) = -x^2 + 2x - 1$ at $(2, -1)$

6) $y = x^3 - 5x^2 + 7x - 3$ at $(0, -3)$

7) $y = -x^3 + 14x^2 - 64x + 94$ at $(5, -1)$

8) $f(x) = x^3 - 2x^2 - 4$ at $(1, -5)$

9) $f(x) = x^3 - 2x^2 - 3$ at $(-1, -6)$

10) $f(x) = -x^3 + 3x^2 - 3$ at $(0, -3)$

11) $f(x) = \dfrac{9x}{x^2 + 9}$ at $(0, 0)$

12) $f(x) = -\dfrac{2}{x^2 - 9}$ at $\left(-2, \dfrac{2}{5}\right)$

13) $y = -\dfrac{x^2}{3x - 3}$ at $\left(-4, \dfrac{16}{15}\right)$

14) $f(x) = -\dfrac{2}{x^2 - 16}$ at $\left(5, -\dfrac{2}{9}\right)$

15) $y = \dfrac{2}{x - 3}$ at $(4, 2)$

16) $y = -(2x - 4)^{\frac{2}{3}}$ at $(-2, -4)$

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

18) $f(x) = (2x + 6)^{\frac{1}{3}}$ at $(1, 2)$

19) $y = (x - 4)^{\frac{2}{3}}$ at $(3, 1)$

20) $f(x) = -(x - 4)^{\frac{2}{3}}$ at $(-4, -4)$

Name_____

Calculus Practice: Using Differentiation to Find a Tangent 1b

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) $f(x) = x^2 + 2x + 1$ at $(-2, 1)$

$y = -2x - 3$

2) $f(x) = \dfrac{x^2}{2} + 2x - 3$ at $\left(-1, -\dfrac{9}{2}\right)$

$y = x - \dfrac{7}{2}$

3) $y = -\dfrac{x^2}{2} + 4x - 6$ at $\left(5, \dfrac{3}{2}\right)$

$y = -x + \dfrac{13}{2}$

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

$y = -1$

5) $f(x) = -x^2 + 2x - 1$ at $(2, -1)$

$y = -2x + 3$

6) $y = x^3 - 5x^2 + 7x - 3$ at $(0, -3)$

$y = 7x - 3$

7) $y = -x^3 + 14x^2 - 64x + 94$ at $(5, -1)$

$y = x - 6$

8) $f(x) = x^3 - 2x^2 - 4$ at $(1, -5)$

$y = -x - 4$

9) $f(x) = x^3 - 2x^2 - 3$ at $(-1, -6)$

$y = 7x + 1$

10) $f(x) = -x^3 + 3x^2 - 3$ at $(0, -3)$

$y = -3$

11) $f(x) = \dfrac{9x}{x^2 + 9}$ at $(0, 0)$

$\quad y = x$

12) $f(x) = -\dfrac{2}{x^2 - 9}$ at $\left(-2, \dfrac{2}{5}\right)$

$\quad y = -\dfrac{8}{25}x - \dfrac{6}{25}$

13) $y = -\dfrac{x^2}{3x - 3}$ at $\left(-4, \dfrac{16}{15}\right)$

$\quad y = -\dfrac{8}{25}x - \dfrac{16}{75}$

14) $f(x) = -\dfrac{2}{x^2 - 16}$ at $\left(5, -\dfrac{2}{9}\right)$

$\quad y = \dfrac{20}{81}x - \dfrac{118}{81}$

15) $y = \dfrac{2}{x - 3}$ at $(4, 2)$

$\quad y = -2x + 10$

16) $y = -(2x - 4)^{\frac{2}{3}}$ at $(-2, -4)$

$\quad y = \dfrac{2}{3}x - \dfrac{8}{3}$

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

$\quad y = \dfrac{1}{2}x - 3$

18) $f(x) = (2x + 6)^{\frac{1}{3}}$ at $(1, 2)$

$\quad y = \dfrac{1}{6}x + \dfrac{11}{6}$

19) $y = (x - 4)^{\frac{2}{3}}$ at $(3, 1)$

$\quad y = -\dfrac{2}{3}x + 3$

20) $f(x) = -(x - 4)^{\frac{2}{3}}$ at $(-4, -4)$

$\quad y = \dfrac{1}{3}x - \dfrac{8}{3}$