work: HW 1.5

1 2 3 4 5

Ex. Score: 0 of 1 pt

Find $\frac{dy}{dx}$.

$y = 7x^{-5}$ $\Rightarrow$ $y' = -35x^{-6}$

OR

$\frac{-35}{x^6}$

$\frac{dy}{dx} =$ ☐

Differentiate.

$y = 2x^3 - 8x^2 + 21x + 8$

$\frac{dy}{dx} =$ ☐ $\Rightarrow 6x^2 - 16x + 21$

Find $\frac{dy}{dx}$ for $y = x^{-1/9}$. $\Rightarrow \frac{dy}{dx} = -\frac{1}{9}x^{-\frac{1}{9}-\frac{9}{9}}$

$= -\frac{1}{9}x^{-10/9}$

OR

$\frac{-1}{9x^{10/9}}$

$\frac{dy}{dx} =$ ☐

Find $\frac{dy}{dx}$.

$y = \frac{80}{x^3}$

$\frac{dy}{dx} = \square$

Rewrite

$80x^{-3} \Rightarrow \frac{dy}{dx} = -240x^{-4}$

OR

$\frac{-240}{x^4}$

Find the derivative.

$\frac{d}{dx}\left(\sqrt[5]{x} - \frac{7}{x}\right) = \square$

Rewrite

$\frac{d}{dx}\left(x^{\frac{1}{5}} - 7x^{-1}\right) =$

$\frac{1}{5}x^{-4/5} + 7x^{-2}$

OR

$\frac{1}{5x^{4/5}} + \frac{7}{x^2}$

$\sqrt[m]{x^n} = x^{\frac{n}{m}}$

Find the derivative of the given function.

$y = \sqrt[5]{2x} = \sqrt[5]{2} \cdot \sqrt[5]{x}$

$\frac{dy}{dx} = \square = \sqrt[5]{2} \cdot x^{\frac{1}{5}} \Rightarrow$

$\frac{dy}{dx} = \frac{\sqrt[5]{2}}{5} x^{-4/5}$ OR $\frac{\sqrt[5]{2}}{5x^{4/5}}$

$y = mx + b$

Find an equation for the line that is tangent to the curve $y = x^3 - 4x$ at the point $(-2, 0)$.

The equation is $y = \square$.

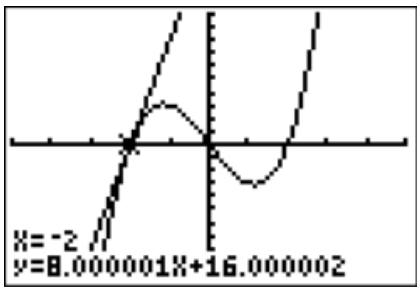
$\frac{dy}{dx} = 3x^2 - 4$; let $x = -2$

$m_T = \frac{dy}{dx}(-2) = 3(-2)^2 - 4 = 8$

$y = mx + b$; $y = 8x + b$ | let $y = 0$, $x = -2$

$0 = 8(-2) + b \Rightarrow b = 16$

$y = 8x + 16$



For the function, find the points on the graph at which the tangent line is horizontal.

$y = x^2 - 4$

when is $\frac{dy}{dx} = 0$?

$\frac{dy}{dx} = 2x$; set $2x = 0 \Rightarrow x = 0$

hz at $(0, -4)$

For the function, find the point(s) on the graph at which the tangent line is horizontal.

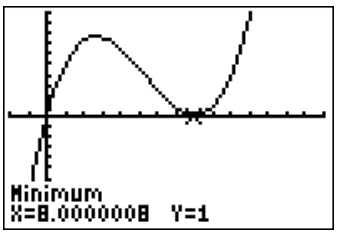
$y = x^3 - 16x^2 + 64x + 1$

$\frac{dy}{dx} = 3x^2 - 32x + 64$

Solve $3x^2 - 32x + 64 = 0$.

$(3x - 8)(x - 8) = 0 \Rightarrow x = \frac{8}{3}, 8$

$\left(\frac{8}{3}, 76\frac{23}{27}\right)$ & $(8, 1)$



For the function, find the point(s) on the graph at which the tangent line has slope 3.

$$y = \frac{1}{3}x^3 - 3x^2 + 11x + 14$$

$\Rightarrow \frac{dy}{dx} = 3$

$$\frac{dy}{dx} = x^2 - 6x + 11$$

$$x^2 - 6x + 11 = 3$$

$$x^2 - 6x + 8 = 0$$

$$(x-4)(x-2) = 0 \Rightarrow x = 4,\ x = 2$$

Y1(4)
31.33333333
Ans▸Frac
94/3

Y1(2)
26.66666667
Ans▸Frac
80/3

$(4, \frac{94}{3})$ & $(2, 80/3)$