3.3 Rules of Differentiation (Solutions)

Warm up:

Solution:

Group work:

Problem 1 *Use the "short-cut derivative rules" to compute the derivatives of the following functions:*

(a) $f(x) = \sqrt{x}$

Solution: $f(x) = \sqrt{x} = x^{\frac{1}{2}}$. *So* $f'(x) = \frac{1}{2}x^{\frac{1}{2}-1} = \frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2\sqrt{x}}$.

(b) $f(x) = \frac{5}{x^2}$

Solution: $f(x) = \frac{5}{x^2} = 5x^{-2}$. *So* $f'(x) = 5(-2)x^{-2-1} = -10x^{-3} = \frac{-10}{x^3}$.

(c) $f(x) = x^5 + 4x^3 + \pi$

Solution: $f'(x) = 5x^{5-1} + 4(3)x^{3-1} + 0 = 5x^4 + 12x^2$. *Note that* $\frac{d}{dx}(\pi) = 0$ *because* π *is a constant.*

Problem 2 ***Solution:***

Problem 3 ***Solution:***

Problem 4 ***Solution:***
