Find the derivatives of the given functions.

1. $f(x) = 2x^{10} + 4x^5 + 20x + \sqrt{2}$

$f'(x) = \boxed{20x^9 + 20x^4 + 20}$

2. $g(x) = \frac{1}{2x^3} + 2 \quad = \frac{1}{2}x^{-3} + 2$

$g'(x) = -\frac{3}{2}x^{-3-1} + 0 = -\frac{3}{2}x^{-4} = \boxed{\frac{-3}{2x^4}}$

3. $y = \frac{1}{x} \quad = x^{-1}$

$y' = -x^{-1-1} = \boxed{\frac{-1}{x^2}}$

4. $g(x) = \sqrt[5]{x^2} = x^{\frac{2}{5}}$

$g'(x) = \frac{2}{5}x^{\frac{2}{5}-1} = \frac{2}{5}x^{-\frac{3}{5}} = \frac{2}{5x^{3/5}} = \boxed{\frac{2}{5\sqrt[5]{x}^3}}$

5. $h(x) = \frac{1}{\sqrt{x}} = x^{-\frac{1}{2}}$

$h'(x) = -\frac{1}{2}x^{-\frac{1}{2}-1} = -\frac{1}{2}x^{-\frac{3}{2}} = \boxed{\frac{-1}{2\sqrt{x}^3}}$

Find the derivatives of the given functions.

1. $f(x) = \frac{x^4}{4} - \pi x^3 - x + 6$ $= \frac{1}{4}x^4 - \pi x^3 - x + 6$

$$f'(x) = \frac{4}{4}x^3 - 3\pi x^2 - 1 = \boxed{x^3 - 3\pi x^2 - 1}$$

2. $y = \frac{5x^3}{3}$ $= \frac{5}{3}x^3$

$$y' = \frac{15}{3}x^2 = \boxed{5x^2}$$

3. $f(x) = \frac{10}{x} + \frac{x}{10}$ $= 10x^{-1} + \frac{1}{10}x$

$$f'(x) = 10(-1)x^{-1-1} + \frac{1}{10} = \boxed{\frac{1}{10} - \frac{10}{x^2}}$$

4. $g(x) = \frac{1}{\sqrt[3]{x^2}}$ $= x^{-\frac{2}{3}}$

$$g'(x) = -\frac{2}{3}x^{-\frac{2}{3}-1} = -\frac{2}{3}x^{-\frac{5}{3}} = \frac{-2}{3x^{5/3}} = \boxed{\frac{-2}{3\sqrt[3]{x^5}}}$$

5. $h(x) = \sqrt{2x}$ $= \sqrt{2}\sqrt{x}$ $= \sqrt{2}x^{\frac{1}{2}}$

$$h'(x) = \sqrt{2}\,\frac{1}{2}x^{-\frac{1}{2}} = \boxed{\frac{\sqrt{2}}{2\sqrt{x}}}$$