

MATH 110 Problem Set 2.3

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The following problems based on Section 2.3 of the textbook will help you study. *You do not need to hand in solutions to these problems.*

1. (Based on 2.3.1–22) Differentiate the following functions using any of the differentiation formulas you know.

$$(a) f(t) = \frac{2t}{4+t^2} \quad (b) y = \frac{x+1}{x^3+x-3} \quad (c) y = \frac{t}{(t-1)^2} \quad (d) g(t) = \frac{t-\sqrt{t}}{t^{1/3}}$$

2. (Based on 2.3.55–58) Find equations of the tangent line and normal line to the curve at the given point.

$$(a) y = (1+2x)^2, (1,9) \quad (b) y = \frac{\sqrt{x}}{x+1}, (4,0.4)$$

3. (Based on 2.3.69–72) If $f(1) = 3$, $f'(1) = -2$, $g(1) = -1$ and $g'(1) = 2$, find $h'(1)$ for the following functions.

$$(a) h(x) = 3f(x) - 5g(x) \quad (c) h(x) = f(x)/g(x) \\ (b) h(x) = f(x)g(x) \quad (d) h(x) = (2f(x)-1)/(g(x)+3)$$

4. (Based on 2.3.80–82) Find equations of the tangent lines to the curve $y = \frac{x-1}{x+1}$ that are parallel to the line $x-2y=2$.

5. (Based on 2.3.87,102) Find an expression for $(fg'h)''$ (the second derivative of the product of three functions).

You may find the following additional exercises from Section 2.3 helpful.

2.3 C-level: 1–22, 25–44, 51–52, 53–54, 55–58, 59–62, 63–66

B-level: 23–24, 45, 46–48, 49–50, 67, 68, 69–72, 73–74, 75–76, 77–82, 83–86, 93–96,

A-level: 87, 88–92, 97–100, 101–110