1 | **Review Sheet**

1.1 | **Problem 1**

1.1.1 | (e)

$$f(x) = x(x^2+2) - \sin(x^4 - x^{90}) + e^{\sin(x)} + \ln\cos(x^2)$$
$$f'(x) = 3x^2 + 2 - (4x^3 - 90x^{89})\cos(x^4 - x^90) + \cos(x)e^{\sin(x)} + -\frac{2x\sin(x^2)}{\cos(x^2)}$$

1.1.2 | (f)

$$y = \frac{x^5 + x^{25}}{\sin(x)} + x^5\sin(x) + x^3\sin(x)e^{5x}$$
$$\frac{d}{dx}[y] = \frac{\sin(x)(5x^4 + 25x^{24}) - \cos(x)(x^4 + x^25)}{\sin^2(x)} + (5x^4\sin(x) + x^5\cos(x)) + ((3x^2\sin(x) + x^3\cos(x))e^{5x} + 5x^4\sin(x)e^{5x})$$

1.2 | **Problem 4**

1.2.1 | (a)

Assuming room temperature $(20$