

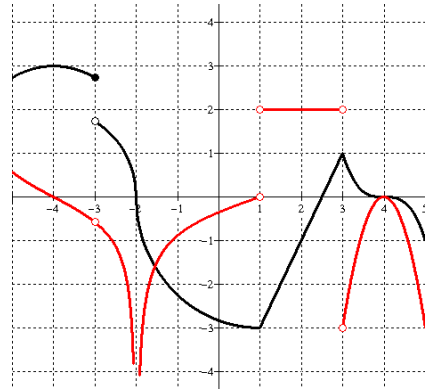
Math 1A
Midterm 2 Review

[1] If the refrigerator temperature is 4°C , the meat will defrost in 5 minutes less time for each 1°C increase in the refrigerator's temperature.

[2] **Compare your final answers with derivatives obtained using the chain and quotient rules.**

[3] [a] $x = -3$ (discontinuous)
 $x = -2$ (vertical tangent line)
 $x = 1, 3$ (cusps)

[b]



[4] [a] $s'(1) = \frac{25}{2}$ [b] $s''(t) = \frac{3}{4}t^{-\frac{5}{2}}(10t^3 + 4t^2 - 3)$

[5] $y - 9 = 12(x - 2)$ and $y + 7 = 12(x + 2)$

[6] $y - 4 = 7(x - 2)$

[7] $\frac{1}{2}$

[8] [a] $y + 8 = 12(x - 2)$ [b] $y - \frac{1}{2} = -\frac{1}{4}(x + 1)$ [c] $y + \frac{\pi}{4} = x + 3$ [d] $y = -3(x - 4)$

[9] **ANSWER WITHHELD (SHOW ME YOUR SOLUTION FOR VERIFICATION)**

[10] $x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$

[11] $6xg'(x^2) + 4x^3g''(x^2)$

[12] $y = 4(x + 1)$

[13] $4ax^3\left(-\frac{x}{4y}\right) = -\frac{ax^4}{y} = -\frac{y}{y} = -1$

[14] $\frac{dy}{dx} = (\sin x)^{\frac{1}{x}}\left(\frac{\cos x}{x \sin x} - \frac{\ln \sin x}{x^2}\right) = \frac{(x \cos x - \sin x \ln \sin x)(\sin x)^{\frac{1}{x}}}{x^2 \sin x}$

[15] $f(x) = xe^{-x}$, $a = -1$ and $\lim_{h \rightarrow 0} \frac{(h-1)e^{1-h} + e}{h} = f'(-1) = (e^{-x} - xe^{-x})\Big|_{x=-1} = 2e$