Quiz 1

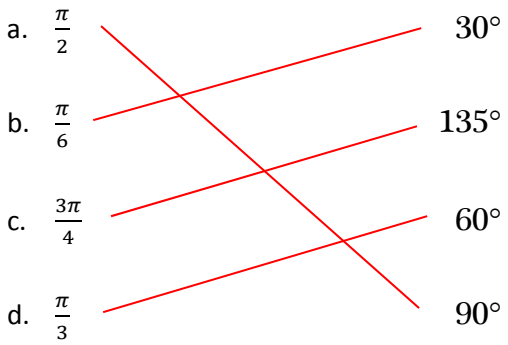
1. (2 points) Simplify: $2+\frac{x}{\left(\frac{3}{x+1}\right)}$

$$= 2+\frac{x}{1}\cdot\frac{x+1}{3} = 2+\frac{x^2+x}{3} = \frac{6}{3}+\frac{x^2+x}{3} = \frac{x^2+x+6}{3}$$

2. (2 points) Factor: $x^4-x^3-6x^2$

$$= x^2\left(x^2-x-6\right) = x^2(x-3)(x+2)$$

3. (2 points) Match the radian measurement of the angle to its corresponding degree measurement.



4. (4 points) Find the 2nd derivative of $f(x)=\arctan(2x)$. (Recall, that $\arctan(u)=\tan^{-1}(u)$.)

$$f'(x) = \frac{1}{(2x)^2+1}\cdot\frac{d}{dx}(2x) = \frac{2}{4x^2+1} \quad OR \quad 2\left(4x^2+1\right)^{-1}$$

$$f''(x) = 2(-1)\left(4x^2+1\right)^{-1-1}\cdot\frac{d}{dx}\left(4x^2+1\right) = -2\left(4x^2+1\right)^{-2}\cdot 8x = -16x\left(4x^2+1\right)^{-2}$$

OR

$$f''(x) = \frac{(0)\left(4x^2+1\right)-(2)(8x)}{(4x^2+1)^2} = -\frac{16x}{(4x^2+1)^2}$$