Name: _____

1. **[2 parts, 1 point each]** Compute the following.

   (a) $\frac{3+2i}{4-i}$

   (b) $(2+i)e^{1-\frac{\pi}{2}i}$

2. **[3 points]** Using a step size of $h = 0.5$, use Euler's method to approximate $y(0.5)$, $y(1)$, and $y(1.5)$ in the initial value problem with $y' = 2(y - x)$ with $y(0) = 1$.

3. **[2 points]** Indicate whether the given differential equations are linear and separable, or can be so transformed after suitable algebraic manipulation. You do not need to show your work.

Equation	Linear? (Yes/No)	Separable? (Yes/No)
$y' = 3t^2y + t$		
$y' = 4y^2 \sin t$		
$(3x)dx - (4y)dy = 0$		
$(y')^3 = ty$		

4. **[3 points]** Find an integrating factor $\mu(x)$ that depends only on x to solve

$$\frac{dy}{dx} = -\left(\frac{y\sin x + 2yx(\cos x)}{x\sin x}\right).$$

Hint: rewrite the equation in standard differential form. After transforming to an exact equation, try imposing $\psi_y = N$ first.