1. Multiple choice: for each of the following integrals, **circle a single method of integration** that will work. Then fill in the relevant information for **just** that method.

(a) (3 points) $\int xe^{x^2}\,dx$

(I) u-substitution $u =$ x^2 $du =$ $2x\,dx$

(II) integration by parts $u =$ _____ $dv =$ _____

(III) trigonometric substitution $x =$ _____ $dx =$ _____

(IV) partial fraction decomposition Form of decomposition: _____

(b) (3 points) $\int \frac{3x}{x^2-5x+6}\,dx$ $= \int \frac{3x}{(x-6)(x+1)}\,dx$

(I) u-substitution $u =$ _____ $du =$ _____

(II) integration by parts $u =$ _____ $dv =$ _____

(III) trigonometric substitution $x =$ _____ $dx =$ _____

(IV) partial fraction decomposition Form of decomposition: $\frac{A}{x-6} + \frac{B}{x+1}$