

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Evaluate $\int t^2 (t^3 - 3)^{10} dt$.

$$\int t^2 u^{10} \cdot \frac{du}{3t^2}$$

$$\frac{1}{3} \int u^{10} du$$

$$\frac{1}{3} \cdot \frac{u^{11}}{11}$$

$$\frac{u^{11}}{33}$$

$$\frac{(t^3 - 3)^{11}}{33} + C$$

Great

$$u = t^3 - 3$$

$$\frac{du}{dt} = 3t^2$$

$$\frac{du}{3t^2} = dt$$

2. Evaluate $\int t \sin t dt$.

2. Evaluate $\int t \sin t dt$. Integration by parts

$$u = t$$

$$v = -\cos t$$

$$u' = 1$$

$$v' = \sin t$$

$$\int u v' = uv - \int v u'$$

$$-t \cos t - \int -\cos t dt$$

$$-t \cos t + \int \cos t dt$$

- sin

$$-t \cos t + \sin t + C$$

Well done