

MATH 19 Quiz 1 SOLUTIONS

1. $\int x^2 e^x dx$

$$= \int x^2 (e^x)' dx$$

$$= e^x x^2 - \int e^x (x^2)' dx$$

$$= e^x x^2 - \int 2x e^x dx$$

$$= e^x x^2 - 2 \int x e^x dx$$

$$= e^x x^2 - 2 \int x (e^x)' dx \quad \text{IBP}$$

$$= e^x x^2 - 2 (e^x x - \int e^x (x)' dx)$$

$$= e^x x^2 - 2e^x x + 2e^x$$

$$= \boxed{e^x (x^2 - 2x + 2)}$$

2. a) $\int_3^{e+2} \ln(x-2) dx$

$$u = x - 2$$

$$du = dx$$

$$= \int_{(3)-2}^{(e+2)-2} \ln u du$$

$$= \int_1^e \ln u du$$

$$= u \ln u \Big|_1^e - u \Big|_1^e$$

IN
CLASS
NOTES

$$= e - (e - 1)$$

$$= \boxed{1}$$

b) $\ln(x-2)$

