

$$ii \int_1^e \ln x dx = (e \ln e - e) - (1 \ln 1 - 1) = 1$$

+C

$$3ai \quad \frac{(1+i)^3}{1-i} = \left(\frac{1+i}{1-i} \times \frac{1+i}{1-i} \right) \times \frac{1+i}{1-i}$$

$$\frac{1+i}{1-i} \times \frac{1+i}{1-i} = -1$$

$$-1 \times \frac{1+i}{1-i} = -1$$

$$ii \quad \frac{3}{(1+i)(2+i)} = \frac{3}{1+3i} = \frac{3}{1+3i} \times \frac{1-3i}{1-3i} = \frac{3-9i}{10}$$

$$= \frac{3}{10} - \frac{9}{10}i$$

$$iii \quad \frac{1+i}{1-i} - \frac{(1+2i)(2+i) + 3-1}{1+i} = \underline{3-7i}$$

$$iv \quad \frac{2i(i-1) + (\sqrt{3}-i) + (1+i)(1+i)}{\sqrt{3-3i}}$$

$$b2 = (4+i)(3-2i) = 26+13i$$

$$R = \sqrt{26^2 + 13^2} = \sqrt{676 + 169} = \underline{29.1}$$