

W.1

# 11. IV

# 12. III

# 12. I

# 14. II

16.2

#4.  $\int_C x e^y ds$ ,  $C$  straight line from  $(2,0)$   
to  $(5,4)$

$$\begin{aligned}\vec{r}(t) &= (1-t)\langle 2, 0 \rangle + t\langle 5, 4 \rangle, & 0 \leq t \leq 1 \\ &= \langle 2 - 2t + 5t, 0 + 4t \rangle \\ &= \langle 3t + 2, 4t \rangle\end{aligned}$$

$$\vec{r}'(t) = \langle 3, 4 \rangle$$

$$\|\vec{r}'(t)\| = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$$

$$\begin{aligned}f(\vec{r}(t)) &= f(3t + 2, 4t) \\ &= (3t + 2)e^{4t}\end{aligned}$$

$$\int_a^b x e^y ds = \int_0^1 (3t+2) e^{4t} \cdot 5 dt$$

$(3t+2)$	$+$	$e^{4t}$
$3$	$-$	$\frac{1}{4}e^{4t}$
$0$		$\frac{1}{16}e^{4t}$

$$= 5 \left[ (3t+2) \cdot \frac{1}{4} e^{4t} - \frac{3}{16} \cdot e^{4t} \right]_0^1$$

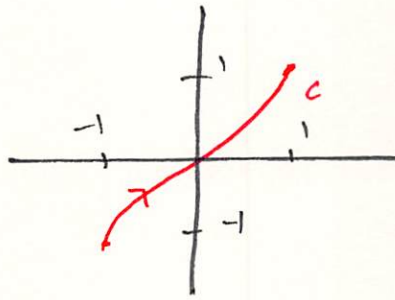
$$= 5 \left[ \frac{5}{4} \cdot e^4 - \frac{3}{16} e^4 - \left( \frac{1}{2} \cdot 1 - \frac{3}{16} \cdot 1 \right) \right]$$

$$= 5 \left( \frac{20-3}{16} \cdot e^4 - \frac{8-3}{16} \right)$$

$$= 5 \left( \frac{17e^4 - 5}{16} \right)$$

$$= \frac{85e^4 - 25}{16}$$

#6.  $\int_C e^x dx$



$$\vec{F}(t) = t\vec{i} + t^3\vec{j}, \quad -1 \leq t \leq 1$$

$$\vec{F}'(t) = \vec{i} + 3t^2\vec{j}$$

$$= \int_{-1}^1 e^t \cdot 1 dt$$

$$= e^t \Big|_{-1}^1$$

$$= e^1 - e^{-1}$$