

Type III

$dy dx dz$

$$E = \{ (x, y, z) \mid z \in [-1, 1] \wedge x \in [-\sqrt{4-yz^2}, \sqrt{4-yz^2}] \wedge y \in [0, 4-x^2-yz^2] \}$$

$$(e) \int_{-1}^1 \int_{-\sqrt{4-yz^2}}^{\sqrt{4-yz^2}} \int_0^{4-x^2-yz^2} f(x, y, z) dy dx dz$$

$dy dz dx$

$$E = \{ (x, y, z) \mid x \in [-2, 2] \wedge z \in [-\sqrt{1-\frac{x^2}{4}}, \sqrt{1-\frac{x^2}{4}}] \wedge y \in [0, 4-x^2-yz^2] \}$$

$$(f) \int_{-2}^2 \int_{-\sqrt{1-\frac{x^2}{4}}}^{\sqrt{1-\frac{x^2}{4}}} \int_0^{4-x^2-yz^2} f(x, y, z) dy dz dx$$

$$\boxed{a=b=c=d=e=f}$$

③ $y=x^2 \quad z=0 \quad y+2z=4 \quad x=\pm\sqrt{y}$
 $z=\frac{4-y}{2} = \frac{4-x^2}{2} \quad x=\pm\sqrt{4-2z}$

Type I

$$dz dy dx : E = \{ (x, y, z) \mid x \in [-2, 2] \wedge y \in [x^2, 4] \wedge z \in [0, \frac{4-y}{2}] \}$$

$$(a) \int_{-2}^2 \int_{x^2}^4 \int_0^{\frac{4-y}{2}} f(x, y, z) dz dy dx$$

$$dz dx dy : E = \{ (x, y, z) \mid y \in [0, 4] \wedge x \in [-\sqrt{y}, \sqrt{y}] \wedge z \in [0, \frac{4-y}{2}] \}$$

$$(b) \int_0^4 \int_{-\sqrt{y}}^{\sqrt{y}} \int_0^{\frac{4-y}{2}} f(x, y, z) dz dx dy$$

Type 2

$$dx dy dz : E = \{ (x, y, z) \mid z \in [0, 2] \wedge y \in [0, 4-2z] \wedge x \in [-\sqrt{y}, \sqrt{y}] \}$$

$$(c) \int_0^2 \int_0^{4-2z} \int_{-\sqrt{y}}^{\sqrt{y}} f(x, y, z) dx dy dz$$