

1

$$-\frac{1}{2}$$

---

2

$$e^{xy} \left( x \sin(x^2 - y^2) - 2y \cos(x^2 - y^2) \right)$$

---

3

$$\Sigma: [0, 2] \times [0, 2\pi] \rightarrow \mathbb{R}^3$$

$$\underline{z}(u, v) = \begin{cases} x(u, v) = 1 + 3\cos v \\ y(u, v) = 3\sin v \\ z(u, v) = u \end{cases}$$

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4

$$12$$

---

5

$$a = 0$$

---

1

$$\frac{1}{2}$$

---

2

$$e^{x^2-y^2} (2x \sin(xy) + y \cos(xy))$$

---

3

$$\underline{z}: [0, 3] \times [0, 2\pi] \rightarrow \mathbb{R}^3$$

$$\underline{z}(u, v) = \begin{cases} x(u, v) = 2 \cos v \\ y(u, v) = 1 + 2 \sin v \\ z(u, v) = u \end{cases}$$

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4

$$16$$

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5

$$a = 1$$

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