



2015年経済(1期)第2問

2 $x = \frac{\sqrt{8} + \sqrt{6}}{\sqrt{3} - \sqrt{2}}$, $y = \frac{\sqrt{8} - \sqrt{6}}{\sqrt{3} + \sqrt{2}}$ とする. このとき, 次の設問に答えよ.

- (1) $x + y$ を計算せよ.
 (2) xy を計算せよ.
 (3) $\frac{1}{x} + \frac{1}{y}$ を計算せよ.
 (4) $x^2 + y^2$ を計算せよ.

$$(1) x = \frac{(\sqrt{8} + \sqrt{6})(\sqrt{3} + \sqrt{2})}{(\sqrt{3} - \sqrt{2})(\sqrt{3} + \sqrt{2})} = 2\sqrt{6} + 4 + 3\sqrt{2} + 2\sqrt{3}$$

$$y = \frac{(\sqrt{8} - \sqrt{6})(\sqrt{3} - \sqrt{2})}{(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})} = 2\sqrt{6} - 4 - 3\sqrt{2} + 2\sqrt{3}$$

$$\text{よって, } \underline{x + y = 4\sqrt{6} + 4\sqrt{3}} //$$

$$(2) xy = \frac{\sqrt{8} + \sqrt{6}}{\sqrt{3} - \sqrt{2}} \cdot \frac{\sqrt{8} - \sqrt{6}}{\sqrt{3} + \sqrt{2}} = \underline{2} //$$

$$(3) \frac{1}{x} + \frac{1}{y} = \frac{x + y}{xy}$$

$$= \frac{4\sqrt{6} + 4\sqrt{3}}{2}$$

$$= \underline{2\sqrt{6} + 2\sqrt{3}} //$$

$$(4) x^2 + y^2 = (x + y)^2 - 2xy$$

$$= (4\sqrt{6} + 4\sqrt{3})^2 - 2 \cdot 2$$

$$= \{4(\sqrt{6} + \sqrt{3})\}^2 - 4$$

$$= 4^2(\sqrt{6} + \sqrt{3})^2 - 4$$

$$= 16(9 + 6\sqrt{2}) - 4$$

$$= \underline{140 + 96\sqrt{2}} //$$