

1 **解答** (1) $2\sqrt{2}$ (2) -7 (3) $-14\sqrt{2}$

(1) $x+y = (\sqrt{2}+3) + (\sqrt{2}-3)$
 $= 2\sqrt{2}$

(2) $xy = (\sqrt{2}+3)(\sqrt{2}-3)$
 $= (\sqrt{2})^2 - 3^2$
 $= 2-9$
 $= -7$

(3) $x^2y + xy^2 = xy(x+y)$
 $= -7 \times 2\sqrt{2}$
 $= -14\sqrt{2}$

2 **解答** (1) $5\sqrt{3} - \sqrt{5}$ (2) 2 (3) $4\sqrt{5}$ (4) $4\sqrt{15}$

(1) $2x-3y = 2(\sqrt{5}+\sqrt{3}) - 3(\sqrt{5}-\sqrt{3})$
 $= 2\sqrt{5} + 2\sqrt{3} - 3\sqrt{5} + 3\sqrt{3}$
 $= 5\sqrt{3} - \sqrt{5}$

(2) $xy = (\sqrt{5}+\sqrt{3})(\sqrt{5}-\sqrt{3})$
 $= (\sqrt{5})^2 - (\sqrt{3})^2$
 $= 5-3$
 $= 2$

(3) $x^2y + xy^2 = xy(x+y)$
 $x+y = (\sqrt{5}+\sqrt{3}) + (\sqrt{5}-\sqrt{3}) = 2\sqrt{5}$, $xy = 2$
 であるから $xy(x+y) = 2 \times 2\sqrt{5}$
 $= 4\sqrt{5}$

(4) $x^2-y^2 = (x+y)(x-y)$
 $x+y = 2\sqrt{5}$, $x-y = (\sqrt{5}+\sqrt{3}) - (\sqrt{5}-\sqrt{3}) = 2\sqrt{3}$
 であるから $(x+y)(x-y) = 2\sqrt{5} \times 2\sqrt{3}$
 $= 4\sqrt{15}$

3 **解答** (1) $14 - \sqrt{6}$ (2) 24 (3) $8\sqrt{6}$

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

$= 14 - \sqrt{6}$

(2) $x^2 + 2xy + y^2 = (x+y)^2$
 $x+y = (\sqrt{6}+2) + (\sqrt{6}-2) = 2\sqrt{6}$
 であるから $(x+y)^2 = (2\sqrt{6})^2$
 $= 24$

(3) $x^2-y^2 = (x+y)(x-y)$
 $x+y = 2\sqrt{6}$, $x-y = (\sqrt{6}+2) - (\sqrt{6}-2) = 4$
 であるから $(x+y)(x-y) = 2\sqrt{6} \times 4$
 $= 8\sqrt{6}$