

$$\begin{aligned}
 (1) \quad & \frac{5a-2b}{4} - \frac{3a-7b}{5} \\
 &= \frac{25a-10b-12a+28b}{20} \\
 &= \frac{13a+18b}{20}
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & \frac{1}{6} a^2 b \times a^3 b^2 \div \left(-\frac{1}{2} ab\right)^2 \\
 &= \frac{\cancel{a}^2 \times a^3 \times \cancel{b}^2 \times 2 \times 2}{6 \times \cancel{a} \times \cancel{b}} \\
 &= \frac{2}{3} a^3 b \\
 &= \frac{2}{3} \times (-3)^3 \times \frac{1}{4} \\
 &= -\frac{2 \times 3 \times 3 \times 3}{3 \times 4} \\
 &= -\frac{9}{2}
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & (3\sqrt{3} + \sqrt{2})(3\sqrt{3} - \sqrt{2}) - (\sqrt{6} - 4)^2 \\
 &= (27 - 2) - (6 - 8\sqrt{6} + 16) \\
 &= 25 - 22 + 8\sqrt{6} \\
 &= 3 + 8\sqrt{6}
 \end{aligned}$$

(4) 以下の式に $x=1, y=-3$ を代入すると

$$\begin{cases}
 a - 3b = -11 \quad \dots \textcircled{1} \\
 -3a + b = 17 \quad \dots \textcircled{2}
 \end{cases}$$

$$\begin{array}{r}
 \textcircled{1} \times 3 + \textcircled{2} \\
 3a - 9b = -33 \\
 + \quad -3a + b = 17 \\
 \hline
 -8b = -16 \\
 b = 2 \quad \dots \textcircled{3}
 \end{array}$$

③を①に代入して

$$\begin{aligned}
 a - 6 &= -11 \\
 a &= -5
 \end{aligned}$$

$$\underline{A \quad a = -5, b = 2}$$