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[2] (1) $S = \frac{1}{2}ab\sin C = \frac{1}{2} \cdot 6 \cdot 5 \sin 30^\circ = \frac{1}{2} \cdot 6 \cdot 5 \cdot \frac{1}{2} = \frac{15}{2}$

(2) $S = \frac{1}{2}bc\sin A = \frac{1}{2} \cdot 2 \cdot 3 \sin 120^\circ = \frac{1}{2} \cdot 2 \cdot 3 \cdot \frac{\sqrt{3}}{2} = \frac{3\sqrt{3}}{2}$

(3) $S = \frac{1}{2}ca\sin B = \frac{1}{2} \cdot 3 \cdot 2\sqrt{2} \sin 45^\circ = \frac{1}{2} \cdot 3 \cdot 2\sqrt{2} \cdot \frac{1}{\sqrt{2}} = 3$

(4) $S = \frac{1}{2}ab\sin C = \frac{1}{2} \cdot \sqrt{6} \cdot 3\sqrt{3} \sin 135^\circ = \frac{1}{2} \cdot \sqrt{6} \cdot 3\sqrt{3} \cdot \frac{1}{\sqrt{2}} = \frac{9}{2}$

(5) $S = \frac{1}{2} \cdot 2 \cdot 2 \sin 60^\circ = \frac{1}{2} \cdot 2 \cdot 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3}$

[3] (1) $\cos A = \frac{5^2 + 4^2 - 6^2}{2 \cdot 5 \cdot 4} = \frac{5}{2 \cdot 5 \cdot 4} = \frac{1}{8}$

(2) $\sin^2 A = 1 - \cos^2 A = 1 - \left(\frac{1}{8}\right)^2 = \frac{63}{64}$

$\sin A > 0$ であるから $\sin A = \sqrt{\frac{63}{64}} = \frac{3\sqrt{7}}{8}$

(3) $S = \frac{1}{2}bc\sin A = \frac{1}{2} \cdot 5 \cdot 4 \cdot \frac{3\sqrt{7}}{8} = \frac{15\sqrt{7}}{4}$

[4] (1) $\cos A = \frac{8^2 + 11^2 - 5^2}{2 \cdot 8 \cdot 11} = \frac{160}{2 \cdot 8 \cdot 11} = \frac{10}{11}$

よって $\sin^2 A = 1 - \cos^2 A = 1 - \left(\frac{10}{11}\right)^2 = \frac{21}{121}$

$\sin A > 0$ であるから $\sin A = \sqrt{\frac{21}{121}} = \frac{\sqrt{21}}{11}$

したがって $S = \frac{1}{2}bc\sin A = \frac{1}{2} \cdot 8 \cdot 11 \cdot \frac{\sqrt{21}}{11} = 4\sqrt{21}$

(2) $\cos A = \frac{2^2 + (\sqrt{10})^2 - 3^2}{2 \cdot 2 \cdot \sqrt{10}} = \frac{5}{2 \cdot 2 \cdot \sqrt{10}} = \frac{\sqrt{10}}{8}$

よって $\sin^2 A = 1 - \cos^2 A = 1 - \left(\frac{\sqrt{10}}{8}\right)^2 = \frac{54}{64}$

$\sin A > 0$ であるから $\sin A = \sqrt{\frac{54}{64}} = \frac{3\sqrt{6}}{8}$

したがって $S = \frac{1}{2}bc\sin A = \frac{1}{2} \cdot 2 \cdot \sqrt{10} \cdot \frac{3\sqrt{6}}{8} = \frac{3\sqrt{15}}{4}$

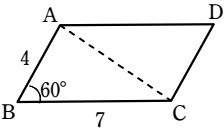
[5] (1) $S = \triangle ABC + \triangle CDA = 2\triangle ABC$ から

$S = 2 \cdot \frac{1}{2} \cdot AB \cdot BC \sin \angle ABC$

$= 2 \cdot \frac{1}{2} \cdot 4 \cdot 7 \sin 60^\circ$

$= 2 \cdot \frac{1}{2} \cdot 4 \cdot 7 \cdot \frac{\sqrt{3}}{2}$

$= 14\sqrt{3}$



(2) $AB = CD = 9$

$S = \triangle ABC + \triangle CDA = 2\triangle ABC$ から

$S = 2 \cdot \frac{1}{2} \cdot AB \cdot BC \sin \angle ABC$

$= 2 \cdot \frac{1}{2} \cdot 9 \cdot 5 \sin 135^\circ$

$= 2 \cdot \frac{1}{2} \cdot 9 \cdot 5 \cdot \frac{1}{\sqrt{2}}$

$= \frac{45\sqrt{2}}{2}$

