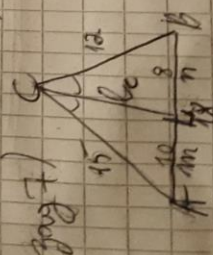


3.20.3) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $\Rightarrow \frac{31}{\sin 31^\circ} = \frac{21.2}{\sin 21.2^\circ} = \frac{528}{\sin \gamma}$
 $\sin \gamma = \frac{528 \cdot \sin 31^\circ}{31} = 0.95$ $\Rightarrow \gamma = 60^\circ$

3.20.5) $a=6\text{cm}$, $b=8\text{cm}$, $m_c=5\text{cm}$
 $c^2 = a^2 + b^2 - 2ab \cos \gamma$
 $100 = 36 + 64 - 2 \cdot 6 \cdot 8 \cos \gamma$
 $100 = 100 - 96 \cos \gamma$
 $96 \cos \gamma = 0$ $\Rightarrow \cos \gamma = 0$ $\Rightarrow \gamma = 90^\circ$



$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
 $\frac{12}{\sin 12.15^\circ} = \frac{10.7}{\sin 10.7^\circ} = \frac{100}{\sin \gamma}$
 $\sin \gamma = \frac{100 \cdot \sin 12.15^\circ}{12} = 0.95$
 $\gamma = 60^\circ$

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
 $\frac{10}{\sin 15^\circ} = \frac{12}{\sin 12^\circ} = \frac{100}{\sin \gamma}$
 $\sin \gamma = \frac{100 \cdot \sin 15^\circ}{10} = 0.95$
 $\gamma = 60^\circ$

$\sin 120^\circ / 2$
 $b = 2\sqrt{3}$
 $c = 8$
 $\alpha = 90^\circ$
 $S = ?$

$S = \frac{b \cdot c \cdot \sin \alpha}{2}$
 $S = \frac{2\sqrt{3} \cdot 8 \cdot \sin 90^\circ}{2}$
 $S = 12\sqrt{3}$

$\alpha = 90^\circ$
 $c = 4$
 $\beta = 135^\circ$
 $S = ?$

$S = \frac{a \cdot c \cdot \sin \beta}{2} = \frac{10 \cdot 4 \cdot \sqrt{2}}{2} = 10\sqrt{2} \text{ cm}^2$

$\alpha = 4\sqrt{7} \text{ cm}$
 $c = 4 \text{ cm}$
 $\alpha = 120^\circ$
 $S = ?$

$a^2 = b^2 + c^2 - 2bc \cos 120^\circ$
 $16.7 = b^2 + 16 - 2b \cdot \frac{1}{2}$
 $112 = b^2 + 16 - 4b$
 $b^2 - 4b - 96 = 0$
 $b_1 = 24$
 $b_2 = -10$
 $S = \frac{1}{2} \cdot b \cdot c \cdot \sin 120^\circ$
 $S = \frac{1}{2} \cdot 24 \cdot 4 \cdot \frac{\sqrt{3}}{2}$
 $S = 6\sqrt{3} \text{ cm}^2$

$a = 9$
 $b = 6$
 $c = 5$
 $S = ?$

$S = \frac{1}{2}(p-a)(p-b)(p-c)$
 $S = \frac{1}{2}(10)(10-9)(10-6)(10-5)$
 $S = \frac{1}{2} \cdot 10 \cdot 1 \cdot 4 \cdot 5$
 $S = 100$

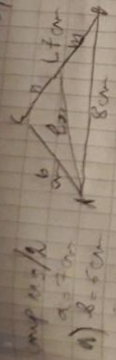
$a = 9$
 $b = 10$
 $c = 17$
 $S = ?$

$p = \frac{9+10+17}{2}$
 $p = 18$
 $S = \frac{1}{2}(18-9)(18-10)(18-17)$
 $S = \frac{1}{2} \cdot 9 \cdot 8 \cdot 1$
 $S = 36$

$$110/2, 3, 4$$

$$\frac{\sqrt{228}}{100} \cdot \frac{100}{4} = \sqrt{57} \text{ cm}$$

$$180/2, 3, 4, 5, 7$$



$$\frac{AL}{LC} = \frac{AB}{BC}$$

$$\frac{m}{n} = \frac{6}{8} = \frac{3}{4}$$

$$\frac{m}{m+n} = \frac{3}{3+4} = \frac{3}{7}$$

$$\frac{m}{7-m} = \frac{3}{4}$$

$$4m = 21 - 3m$$

$$7m = 21$$

$$m = 3$$

$$n = 7 - m = 4$$

$$h = 6 \text{ cm}$$

$$L^2 = a^2 + c^2 - m \cdot n$$

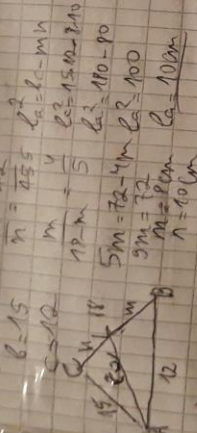
$$L^2 = 6^2 + 8^2 - 3 \cdot 4$$

$$L^2 = 36 + 64 - 12$$

$$L^2 = 88$$

$$L = \sqrt{88} = 2\sqrt{22}$$

$$5) a=18, b=15$$



$$\frac{m}{n} = \frac{18}{15} = \frac{6}{5}$$

$$\frac{m}{m+n} = \frac{6}{6+5} = \frac{6}{11}$$

$$\frac{m}{10-m} = \frac{6}{5}$$

$$5m = 60 - 6m$$

$$11m = 60$$

$$m = \frac{60}{11}$$

$$n = 10 - m = \frac{50}{11}$$

$$h = 8 \text{ cm}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 15^2 - \frac{60}{11} \cdot \frac{50}{11}$$

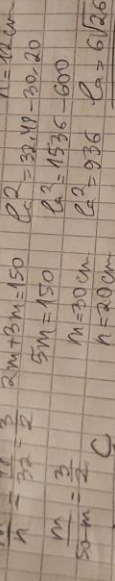
$$L^2 = 324 + 225 - \frac{3000}{121}$$

$$L^2 = 549 - \frac{3000}{121}$$

$$L^2 = \frac{66381 - 3000}{121} = \frac{63381}{121}$$

$$L = \sqrt{\frac{63381}{121}} = \frac{\sqrt{63381}}{11}$$

$$6) a=39, b=20, c=45$$



$$\frac{m}{n} = \frac{39}{20} = \frac{39}{20}$$

$$\frac{m}{m+n} = \frac{39}{39+20} = \frac{39}{59}$$

$$\frac{m}{12-m} = \frac{39}{59}$$

$$59m = 468 - 39m$$

$$98m = 468$$

$$m = \frac{468}{98} = \frac{234}{49}$$

$$n = 12 - m = \frac{588 - 234}{49} = \frac{354}{49}$$

$$h = 9 \text{ cm}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

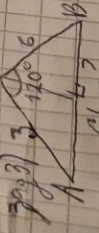
$$L^2 = 39^2 + 20^2 - \frac{234}{49} \cdot \frac{354}{49}$$

$$L^2 = 1521 + 400 - \frac{82836}{2401}$$

$$L^2 = 1921 - \frac{82836}{2401}$$

$$L^2 = \frac{461161 - 82836}{2401} = \frac{378325}{2401}$$

$$L = \sqrt{\frac{378325}{2401}} = \frac{\sqrt{378325}}{49}$$



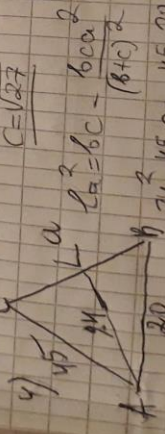
$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$



$$\frac{m}{n} = \frac{15}{20} = \frac{3}{4}$$

$$\frac{m}{m+n} = \frac{3}{3+4} = \frac{3}{7}$$

$$\frac{m}{25-m} = \frac{3}{4}$$

$$4m = 75 - 3m$$

$$7m = 75$$

$$m = \frac{75}{7}$$

$$n = 25 - m = \frac{175 - 75}{7} = \frac{100}{7}$$

$$h = 12 \text{ cm}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 15^2 + 20^2 - \frac{75}{7} \cdot \frac{100}{7}$$

$$L^2 = 225 + 400 - \frac{7500}{49}$$

$$L^2 = 625 - \frac{7500}{49}$$

$$L^2 = \frac{30625 - 7500}{49} = \frac{23125}{49}$$

$$L = \sqrt{\frac{23125}{49}} = \frac{\sqrt{23125}}{7}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$

$$L^2 = a^2 + b^2 - m \cdot n$$

$$L^2 = 18^2 + 18^2 - 9 \cdot 9$$

$$L^2 = 324 + 324 - 81$$

$$L^2 = 567$$

$$L = \sqrt{567} = 3\sqrt{63} = 9\sqrt{7}$$