

1. Ergänzen Sie die folgende Tabelle.

Die Zahlenwerte der Strecken haben die Einheit cm.

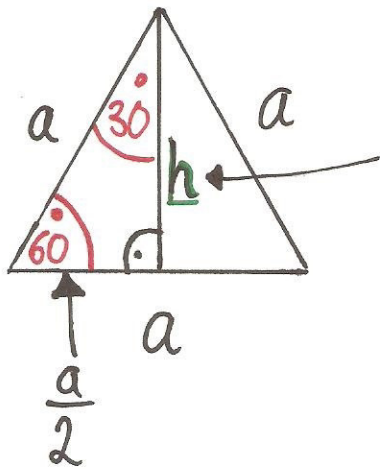
	<b>a</b>	<b>b</b>	<b>c</b>	<b><math>\alpha</math></b>	<b><math>\beta</math></b>
a)	43	89,5	99,3	25,67°	64,33°
b)	105,5	72	127,8	55,7°	34,3°
c)	30,5	68,5	75	24°	66°
d)	14	8	16,1	60,26°	29,75°
e)	3,5	16,4	16,8	12,03°	77,98°

2. Ergänzen Sie die folgende Tabelle.

Die Zahlenwerte der Strecken haben die Einheit cm.

	<b>a</b>	<b>c</b>	<b>h</b>	<b><math>\alpha</math></b>	<b><math>\gamma</math></b>
a)	14	10,5	12,9	67,84°	44,33°
b)	12,7	20,8	7,3	35°	110°
c)	27,4	40,5	18,4	42,33°	95,34°
d)	30,4	16	29,3	74,75°	30,5°
e)	26	14,7	24,9	73,58°	32,84°
f)	17,9	7,4	17,5	78°	24°
g)	20	32	12	36,87°	106,26°
h)	19,3	32	10,8	34,02°	111,96°

3.)



Pythagoras

$$h^2 = a^2 - \left(\frac{a}{2}\right)^2 = a^2 - \frac{a^2}{4} = \frac{3}{4} a^2$$

$$\Rightarrow \underline{h} = \sqrt{\frac{3}{4} a^2} = \sqrt{\frac{3}{4}} a = \left(\frac{\sqrt{3}}{2} a = \frac{a}{2} \cdot \sqrt{3}\right) \quad (*)$$

$$a) \underline{\sin(30^\circ)} = \frac{G}{H} = \frac{\frac{a}{2}}{a} = \frac{\frac{1}{2}a}{a} = \underline{\underline{\frac{1}{2}}}$$

$$b) \underline{\cos(30^\circ)} = \frac{A}{H} = \frac{h}{a} = \frac{\sqrt{\frac{3}{4}} a}{a} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2} = \underline{\underline{\frac{1}{2} \sqrt{3}}}$$

$$c) \underline{\tan(30^\circ)} = \frac{G}{A} = \frac{\frac{a}{2}}{h} = \frac{\frac{a}{2}}{\sqrt{\frac{3}{4}} a} = \frac{\frac{1}{2}a}{\sqrt{\frac{3}{4}} a} = \sqrt{\frac{\frac{1}{4}}{\frac{3}{4}}} = \sqrt{\frac{1}{3}} = \frac{1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{3}}{3} = \underline{\underline{\frac{1}{3} \sqrt{3}}}$$

$$\text{oder: } \frac{\frac{a}{2}}{\frac{a}{2} \sqrt{3}} = \frac{1}{\sqrt{3}} = \sqrt{\frac{1}{3}}$$

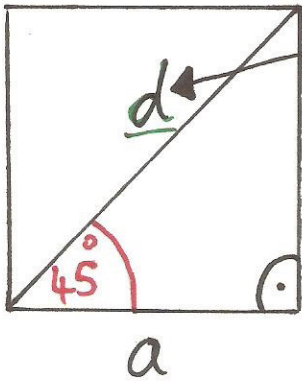
$$d) \underline{\sin(60^\circ)} = \frac{G}{H} = \frac{h}{a} = \cos(30^\circ) = \sqrt{\frac{3}{4}} = \underline{\underline{\frac{1}{2} \sqrt{3}}}$$

$$e) \underline{\cos(60^\circ)} = \frac{A}{H} = \frac{\frac{a}{2}}{a} = \sin(30^\circ) = \underline{\underline{\frac{1}{2}}}$$

$$f) \underline{\tan(60^\circ)} = \frac{G}{A} = \frac{h}{\frac{a}{2}} = \frac{\sqrt{\frac{3}{4}} a}{\frac{a}{2}} = \sqrt{\frac{3}{4}} a \cdot \frac{2}{a} = \sqrt{\frac{3}{4} \cdot 4} = \underline{\underline{\sqrt{3}}}$$

$$\text{oder: } \frac{\frac{a}{2} \sqrt{3}}{\frac{a}{2}} = \sqrt{3}$$

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Pythagoras

$$d^2 = a^2 + a^2 = 2a^2$$

$$\Rightarrow \underline{d} = \sqrt{2a^2} = \underline{\sqrt{2}a}$$

$$a) \underline{\sin(45^\circ)} = \frac{G}{H} = \frac{a}{d} = \frac{a}{\sqrt{2}a} = \frac{1}{\sqrt{2}} = \sqrt{\frac{1}{2}}$$

$$= \frac{1 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{\sqrt{2}}{2} = \underline{\underline{\frac{1}{2}\sqrt{2}}}$$

$$b) \underline{\cos(45^\circ)} = \frac{A}{H} = \frac{a}{d} = \sin(45^\circ) = \sqrt{\frac{1}{2}} = \underline{\underline{\frac{1}{2}\sqrt{2}}}$$

$$c) \underline{\tan(45^\circ)} = \frac{G}{A} = \frac{a}{a} = \underline{\underline{1}}$$

$$5) a) \frac{\sin(\alpha)}{\cos(\alpha)} = \frac{\frac{a}{c}}{\frac{b}{c}} = \frac{a}{\cancel{c}} \cdot \frac{\cancel{c}}{b} = \frac{a}{b} = \tan(\alpha)$$

$$b) [\sin(\alpha)]^2 + [\cos(\alpha)]^2 = \left(\frac{a}{c}\right)^2 + \left(\frac{b}{c}\right)^2 = \frac{a^2}{c^2} + \frac{b^2}{c^2} = \frac{a^2 + b^2}{c^2} \stackrel{\text{Pythagoras}}{=} \frac{c^2}{c^2} = 1$$