

Maxima 5.18.1 <http://maxima.sourceforge.net>
Using Lisp CLISP 2.47 (2008-10-23)
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Dedicated to the memory of William Schelter.
The function bug_report() provides bug reporting information.

(%i1) eq1:c^2 = a^2 + b^2 - 2*a*b*cos(%gamma);

(%o1) $c^2 = b^2 - 2 \cos(\gamma) a b + a^2$

(%i2) eq2:subst([%gamma=alpha,b=d,a=1,c=p+d],eq1);

(%o2) $(p + d)^2 = l^2 - 2 \cos(\alpha) d l + d^2$

(%i3) eq3:d*cos(beta)=h;

(%o3) $\cos(\beta) d = h$

(%i4) eq4:subst(beta=alpha-%pi/2,eq3);

(%o4) $\sin(\alpha) d = h$

(%i5) eq5:d=h/sin(alpha);

(%o5) $d = \frac{h}{\sin(\alpha)}$

(%i6) eq6:subst(eq5,eq2);

(%o6) $\left(p + \frac{h}{\sin(\alpha)}\right)^2 = l^2 - \frac{2 \cos(\alpha) h l}{\sin(\alpha)} + \frac{h^2}{\sin(\alpha)^2}$

(%i7) solve(eq6,p);

(%o7)
$$\left[p = -\frac{\sqrt{\sin(\alpha)^2 l^2 - 2 \cos(\alpha) \sin(\alpha) h l + h^2} + h}{\sin(\alpha)}, p = \frac{\sqrt{\sin(\alpha)^2 l^2 - 2 \cos(\alpha) \sin(\alpha) h l + h^2} - h}{\sin(\alpha)} \right]$$

(%i8) %[2];

(%o8) $p = \frac{\sqrt{\sin(\alpha)^2 l^2 - 2 \cos(\alpha) \sin(\alpha) h l + h^2} - h}{\sin(\alpha)}$

(%i9)