Mathematics 10D

7.6 Solving Right Triangle Problems

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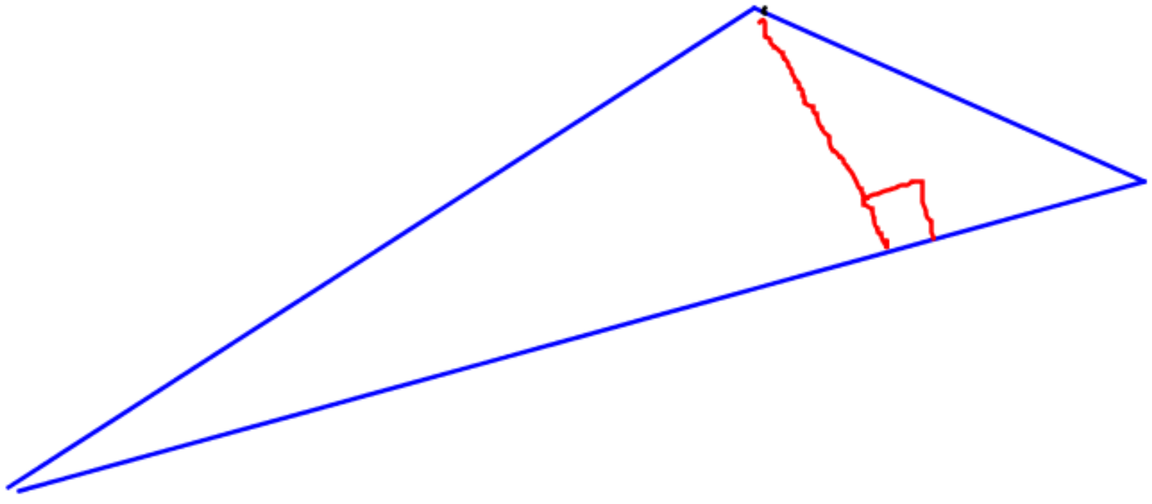
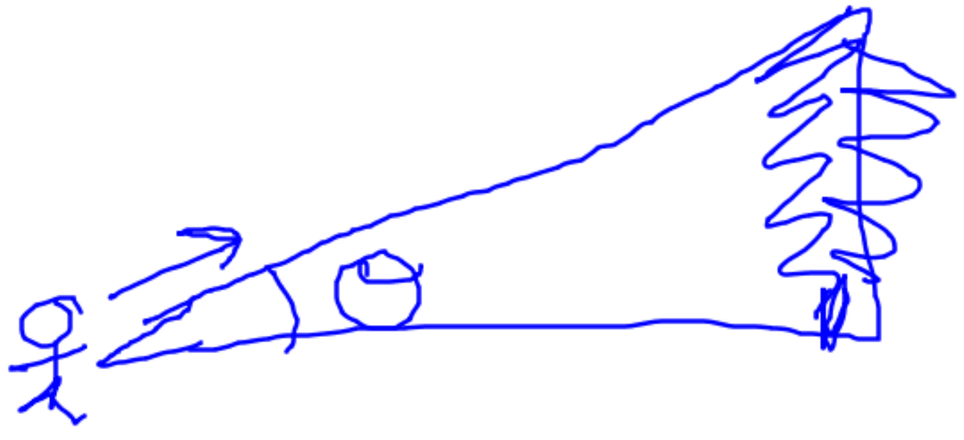


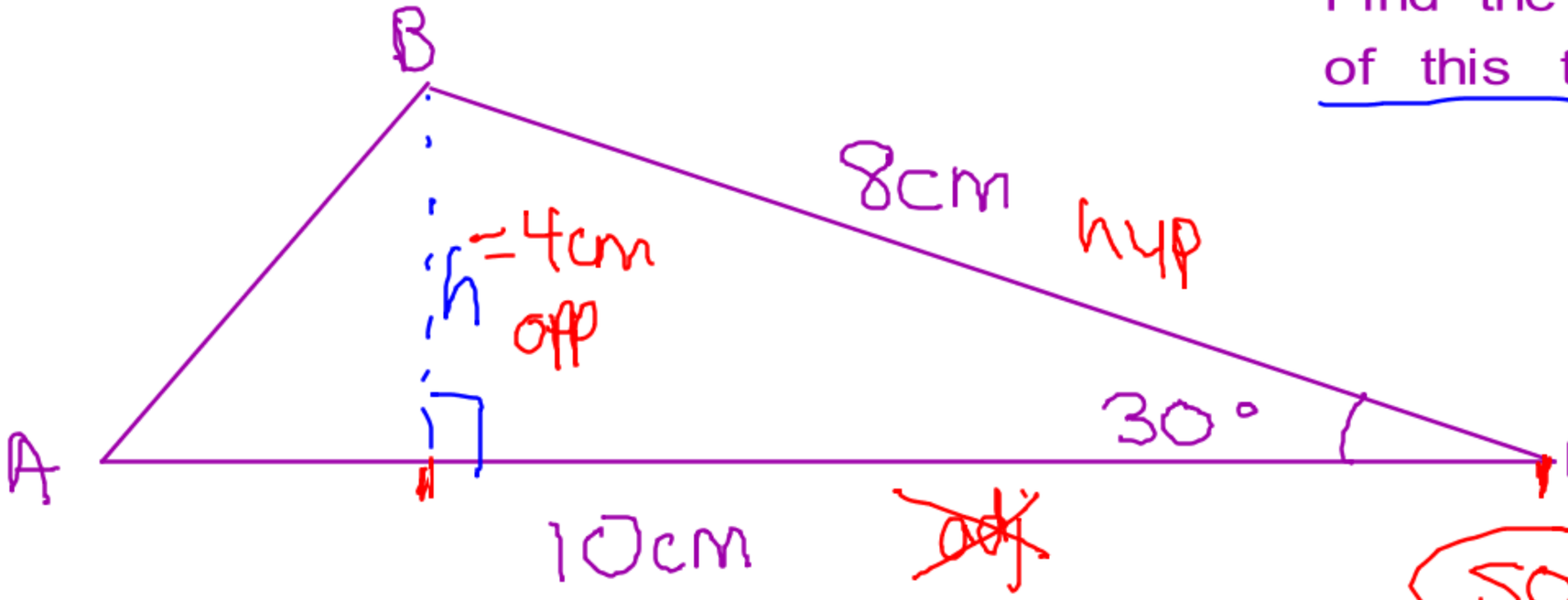
SOH CAH TOA
↳ require a right △.

Tools you have: Similar triangles, SOH CAH TOA, Equation of a line and knowledge of perpendicular slope.

Angle of elevation and depression.



Find the area of this triangle.



SOH CAH TOA

h value:

$\sin\theta = \frac{opp}{hyp}$

$8cm(\sin(30°)) = \left(\frac{h}{8cm}\right)8cm$

$8cm(\sin(30°)) = h$

$4cm = h.$

$A_{\Delta ABC} = \frac{bh}{2}$

$= \frac{10cm(h)}{2}$

$= \frac{10cm(4cm)}{2}$

$= 20cm^2$

∴ Area of $\Delta ABC = 20cm^2$

Canada requires that wheelchair ramps are no more steep than 1cm to 12cm (1cm rise to 12cm run). Find the maximum ~~slope~~ the ramp can be.

angle of elevation

$\tan\theta = \frac{opp}{adj}$

$\tan\theta = \frac{1}{12}$

$\tan^{-1}(\tan\theta) = \tan^{-1}\left(\frac{1}{12}\right)$

$\theta = \tan^{-1}\left(\frac{1}{12}\right)$

$\theta \approx 4.76°$

SOH CAH TOA ✓

∴ The max. angle of elevation of a wheelchair ramp in Canada is 4.76°.