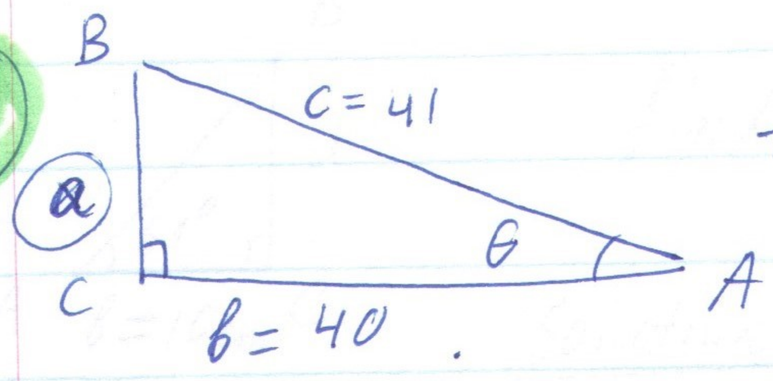
MTH 30 . Homework

Section 4.3 / 6, 10, 16, 30, 32

#6



find the missing side, then find the values of all trig. functions at θ.

Solution: by Pythagorean theorem: $\text{hypotenuse}^2 = \text{leg}^2 + \text{leg}^2$

$c^2 = a^2 + b^2$.

$a^2 + 40^2 = 41^2$

$a^2 = 41^2 - 40^2 = 1681 - 1600 = 81$ $\boxed{a = 9}$

$\sin\theta = \frac{a}{c} = \frac{\text{opposite}}{\text{hyp.}} = \boxed{\frac{9}{41}}$

$\cos\theta = \frac{b}{c} = \frac{\text{adj}}{\text{hyp.}} = \boxed{\frac{40}{41}}$

$\tan\theta = \frac{a}{b} = \frac{\text{opp.}}{\text{adj}} = \boxed{\frac{9}{40}}$, $\cot\theta = \frac{b}{a} = \boxed{\frac{40}{9}}$

$\csc\theta = \frac{c}{a} = \frac{\text{hyp.}}{\text{opp.}} = \boxed{\frac{41}{9}}$, $\sec\theta = \frac{c}{b} = \frac{\text{hyp.}}{\text{adj}} = \boxed{\frac{41}{40}}$

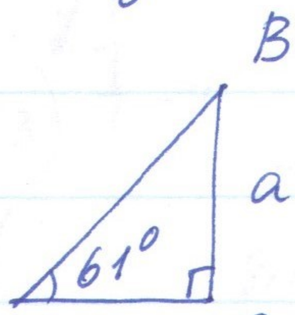
#10 $\tan 30^\circ = \boxed{\frac{1}{\sqrt{3}}}$

#16 $\tan \frac{\pi}{4} + \csc \frac{\pi}{6} = 1+2 = \boxed{3}$

$\tan \frac{\pi}{4} = \tan 45^\circ = \frac{1}{1} = 1$

$\csc \frac{\pi}{6} = \csc 30^\circ = \frac{2}{1} = 2$

#30

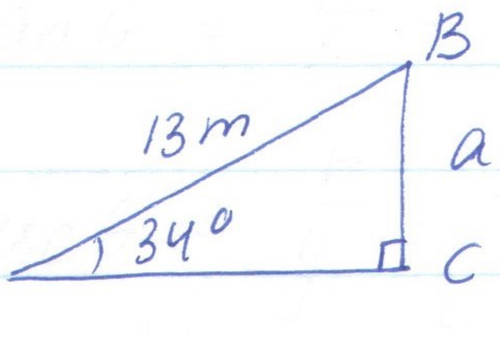


find a.

Solution: $\tan 61^\circ = \frac{a}{b} = \frac{a}{10}$

$a = \tan 61^\circ \cdot 10 \approx 18.$ $\boxed{a \approx 18 cm}$

#32



find a

Solution: $\sin 34^\circ = \frac{a}{13}$ $a = \sin 34^\circ \cdot 13 \approx 7.$

$\boxed{a \approx 7m}$