

$$\mathbb{Z} = \{ \dots, -3, -2, -1, 0, 1, 2, 3, \dots \} = \{x \mid x \text{ is an integer} \}$$

= set of integers

$$\mathbb{N} = \{1, 2, 3, \dots\} = \text{Natural \#s}$$

$$\mathbb{Q} = \text{Rational \#s} = \left\{ \frac{p}{q} \mid p, q \in \mathbb{Z} \text{ and } q \neq 0 \right\}$$

$$\mathbb{R} = \text{Real \#s}$$

$\exists$  - There is; there exists.

$\ni$  - such that; so that

$\implies$  - implies

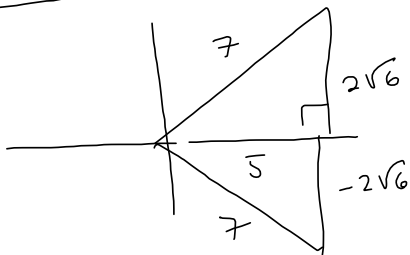
$\iff$  - if and only if  $A \iff B$  means  
 $A$  implies  $B$  &  $B$  implies  $A$ . (Logical equivalence)

$\iff$  means "iff" is another way to write it.

$A$  is  $!$  -  <sup>$A$  is</sup> unique.

$$\cos \theta = \frac{5}{7}$$

Find all solutions



short<sup>2</sup> + medium<sup>2</sup> = long<sup>2</sup>. 7 is long side.

$$\sqrt{7^2 - 5^2} = \sqrt{49 - 25} = \sqrt{24}$$

$$\begin{array}{r} 2 \overline{) 24} \\ \underline{4} \phantom{0} \\ 20 \\ \underline{4} \phantom{0} \\ 16 \\ \underline{12} \\ 4 \end{array}$$

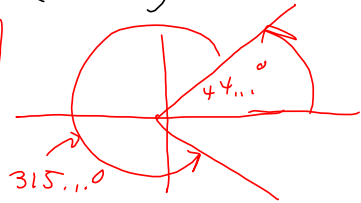
$$\sqrt{24} = 2\sqrt{6}$$

$$\cos^{-1}\left(\frac{5}{7}\right) \approx 0.7751933733 \approx 44.41530859^\circ$$

finds one of them. The other's found by:

$$360^\circ - 44.41530859^\circ \approx 315.5846914^\circ$$

$$2\pi - .7751933733 \text{ OR just } (315.5846914^\circ) \left(\frac{\pi}{180^\circ}\right) \approx 5.507991934$$



cosine is  $2\pi$ - or  $360^\circ$ -periodic, so for ALL solutions,

$$\theta \in \left\{ x + 360^\circ n \mid x = 44.415^\circ \text{ OR } 315.585^\circ, n \in \mathbb{Z} \right\}$$

$$= \left\{ x + 2\pi n \mid x = .775 \text{ or } 5.508, n \in \mathbb{Z} \right\}$$

