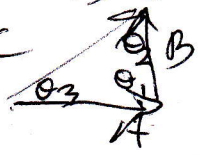
P. 460 1, 5, 13, 17 a, b

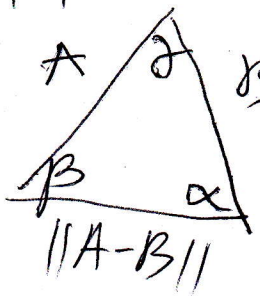
1. $t = \frac{A \cdot B}{B \cdot B} = \frac{1+4+6}{1+4+4} = \frac{11}{9}$, $tB = \left(\frac{11}{9}, \frac{22}{9}, \frac{22}{9}\right)$

5. 

$\cos\theta_1 = \frac{A \cdot B}{\|A\|\|B\|} = \frac{2+3-5}{\sqrt{6}\sqrt{35}} = 0$

$\|A\| = \sqrt{6}$
$\|B\| = \sqrt{35}$
$\|C\| = \sqrt{41}$

$\cos\theta_2 = \frac{B \cdot C}{\|B\|\|C\|} = \frac{3+12+20}{\sqrt{35}\sqrt{41}} = \boxed{\frac{\sqrt{35}}{\sqrt{41}}}$, $\cos\theta_3 = \frac{A \cdot C}{\|A\|\|C\|} = \frac{6+4-4}{\sqrt{6}\sqrt{41}} = \boxed{\frac{\sqrt{6}}{\sqrt{41}}}$

13. 

$\|A-B\|^2 = \|A\|\|A-B\|\cos\beta + \|B\|\|A+B\|\cos\alpha$

$\|A\|^2 = \|A\|\|A-B\|\cos\beta + \|A\|\|B\|\cos\gamma$

$\|B\|^2 = \|B\|\|A-B\|\cos\alpha + \|B\|\|A\|\cos\gamma$

$\|A\|^2 + \|B\|^2 = \|A\|\|A-B\|\cos\beta + 2\|A\|\|B\|\cos\gamma + \|B\|\|A-B\|\cos\alpha$

$\|A-B\|^2 = \|A\|^2 + \|B\|^2 - 2\|A\|\|B\|\cos\gamma$

17). a $\|A\| \geq 0$; if $A \neq 0$, $\|A\| = \sum_{k=1}^{n} |a_k| > 0$, since A doesn't equal zero vector and absolute value of at least one component > 0

if $A = 0$, $a_1 = 0, a_2 = 0 \ldots a_n = 0$ s.t. $\|A\| = 0$

$$\sum_{k=1}^{n} |ca_k| = |c| \sum_{k=1}^{n} |a_k| = |c|\|A\|$$

h/25 $\|A+B\|^2 \leq (\|A\| + \|B\|)^2$, $\sum_{k=1}^{n} |a_k + b_k|^2 \leq \left(\sum_{k=1}^{n} |a_k| + \sum_{k=1}^{n} |b_k|\right)^2$

$$\sum_{k=1}^{n} |a_k|^2 + 2\sum_{k=1}^{n} |a_k b_k| + \sum_{k=1}^{n} |b_k|^2 \leq \sum_{k=1}^{n} |a_k|^2 + 2\sum_{k=1}^{n} |a_k| \sum_{k=1}^{n} |b_k| + \sum_{k=1}^{n} |b_k|^2$$

$$\sum_{k=1}^{n} |a_k b_k| \leq \sum_{k=1}^{n} |a_k| \sum_{k=1}^{n} |b_k|$$