

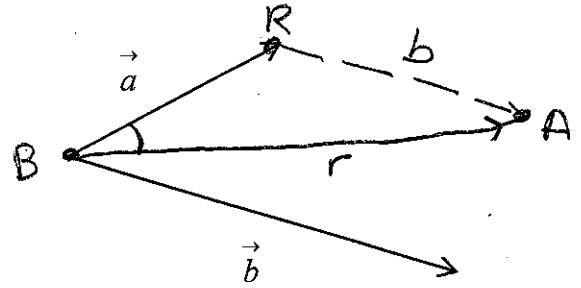
Use the figure to the right.  $\theta$  is the angle formed by the two vectors.

Find: (a) the magnitude of the resultant

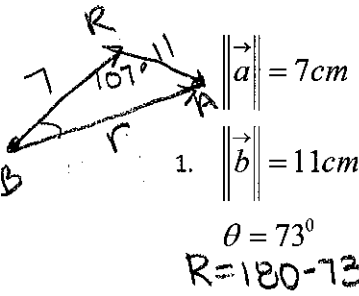
$$r^2 = a^2 + b^2 - 2ab \cos R$$

(b) the measure of the angle that the resultant make with  $a$

$$b^2 = a^2 + r^2 - 2ar \cos B$$



Round answers to the nearest hundredth.



1.  $\|\vec{a}\| = 7\text{cm}$   
 $\|\vec{b}\| = 11\text{cm}$   
 $\theta = 73^\circ$   
 $R = 180 - 73 = 107^\circ$

$$r = \sqrt{7^2 + 11^2 - 2(7)(11)\cos 107^\circ}$$

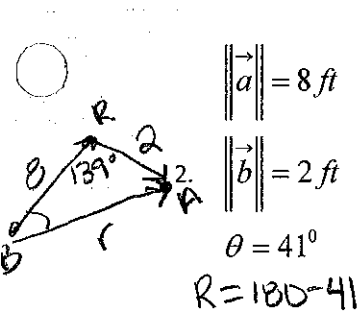
$$r = 14.66\text{cm}$$

$$11^2 = 7^2 + 14.66^2 - 2(7)(14.66)\cos B$$

$$-142.9156 = -205.24\cos B$$

$$.70 = \cos B$$

$$B = 45.87^\circ$$



2.  $\|\vec{a}\| = 8\text{ft}$   
 $\|\vec{b}\| = 2\text{ft}$   
 $\theta = 41^\circ$   
 $R = 180 - 41 = 139^\circ$

$$r = \sqrt{8^2 + 2^2 - 2(8)(2)\cos 139^\circ}$$

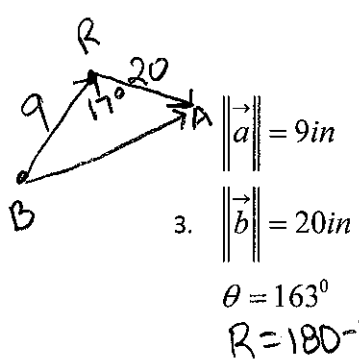
$$r = 9.6\text{ft}$$

$$2^2 = 8^2 + 9.6^2 - 2(8)(9.6)\cos B$$

$$-152.16 = -153.6\cos B$$

$$.99 = \cos B$$

$$B = 7.85^\circ$$



3.  $\|\vec{a}\| = 9\text{in}$   
 $\|\vec{b}\| = 20\text{in}$   
 $\theta = 163^\circ$   
 $R = 180 - 163 = 17^\circ$

$$r = \sqrt{9^2 + 20^2 - 2(9)(20)\cos 17^\circ}$$

$$r = 11.69\text{in}$$

$$20^2 = 9^2 + 11.69^2 - 2(9)(11.69)\cos B$$

$$182.3439 = -210.42\cos B$$

$$-.87 = \cos B$$

$$B = 150.06^\circ$$

answers:

1)  $\|\vec{a} + \vec{b}\| = 14.66\text{cm}; B = 45.87^\circ$

2)  $\|\vec{a} + \vec{b}\| = 9.6\text{ft}; B = 7.85^\circ$

3)  $\|\vec{a} + \vec{b}\| = 11.69\text{in}; B = 150.06^\circ$