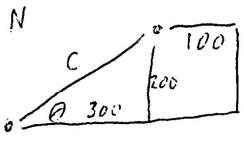
Regular/ Honors Vector Test Review NAME: KEY

**Objectives: P3.2C,d P3.4A**

1. A boat moves east across a lake for 400m, turns northward for 200m, and finally moves due west for 100m. What is the final distance and direction of the boat from its original starting position?

360.6 m

33.7 N of E




(1) $300^2 + 200^2 = C^2$

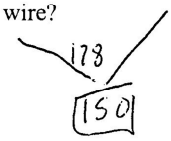
$C = 360.6\ m$

(2) $\tan\theta = \frac{200}{300}$

$\theta = 33.69$

2. A 150kg light hangs between two wires that make a 178º angle with each other. What is the tension in each wire?

42,114.5 n



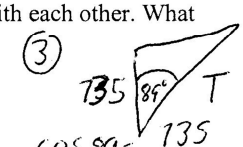

(1) $F_w = 150 \times 9.8$

$F_w = 1470$

(2) $\div 2$

$F_{w\frac{1}{2}} = 735\ N$

(3)




$\cos 89 = \frac{735}{T}$

$T = 735/\cos 89 = 42,114.5\ N$

3. If a 100kg monkey hangs between two cables and the tension of each cable is 1989n, what is the angle between the two cables?

151.5 º

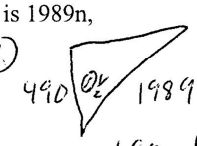

(1.) $F_w = 100 \times 9.8$

$980$

(2.) $\div 2$

$F_{w\frac{1}{2}} = 490$

(3.)




$2^{ND}\ \cos\theta/2 = \frac{490}{1989}$ $\theta/2 = 75.7$

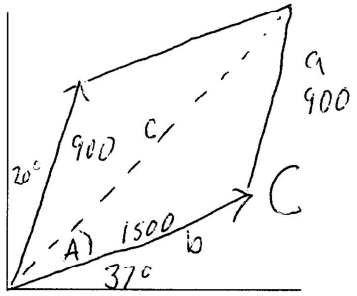
(4.) $\times 2$

$\theta = 151.5$

4. A force acts on a mass with 900n 20º E of N. A second force acts on the mass with 1500n 37º N of E. What is the resultant force and direction?

2307.5 n

49.3 N of E




(1.) $20 + 37 = 57$

$90 - 57 = 33$

$180 - 33 = 147° = \angle C$

(2.) $C = \sqrt{900^2 + 1500^2 - 2 \cdot 900 \cdot 1500 \cos 147}$

$C = 2307.5\ N$

(3) $2^{ND}\ \sin A = \frac{900 \sin 147}{2307.5}$

$A = 12.3°$

(4.) $37 + 12.3 = 49.3$