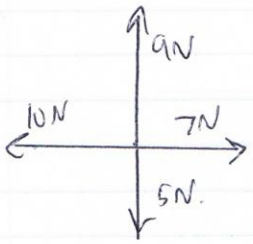
Section 4.3

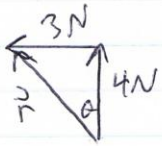
4.



10N force left + 7N right = 3N left

9N force up + 5N down = 4N up.

So...



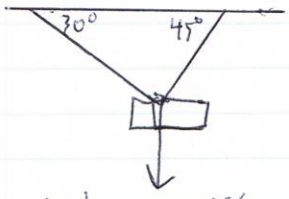
$|\vec{r}| = 5$ ← answer.

$\tan\theta = \frac{3}{4}$

$\theta \doteq 37°$ ← not needed.

∴ magnitude of resultant is 5N.

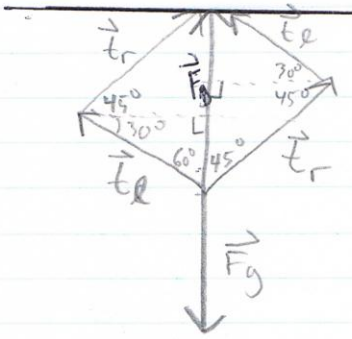
9. picture



$10\text{kg} \times 9.8\ \text{N/kg}$

$|\vec{F}_g| = 98\text{N}$

vector or force diagram.



$|\vec{F}| = |\vec{F}_g|$

$= 98\text{N}.$

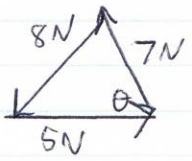
$\vec{F} = \vec{t}_\ell + \vec{t}_r$

$$\frac{|\vec{t}_r|}{\sin 60°} = \frac{98}{\sin 75°} \qquad \frac{|\vec{t}_\ell|}{\sin 45°} = \frac{98}{\sin 75°}$$

$$|\vec{t}_r| = \frac{98 \sin 60°}{\sin 75°} \qquad |\vec{t}_\ell| = \frac{98 \sin 45°}{\sin 75°}$$

$|\vec{t}_r| \doteq 88\text{N}.$ $\qquad |\vec{t}_\ell| \doteq 72\text{N}.$

12.

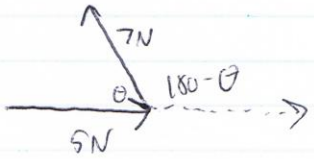
a) 

Form a triangle arranged head-to-tail.

b) $8^2 = 5^2 + 7^2 - 2(5)(7)\cos\theta$

$$\cos\theta = \frac{8^2 - 5^2 - 7^2}{-2(5)(7)}$$

$\theta \doteq 82°$



angles between vectors when "tail-to-tail"

Angle between forces is $\doteq 180 - 82°$

$\doteq 98°$