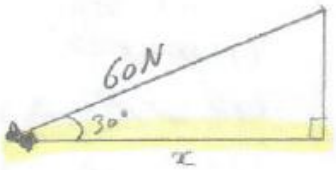
Work / Force Class Problems:

name: SOLUTIONS

Show all work/formulas.

1) A woman pushing a shopping cart uses 60N of force directed 30° from horizontal (see diagram). The woman walks a total of 78m while inside a grocery store.

Using Trigonometry:
Calculate the effective force.
Calculate the work done.



CAH

$\cos\theta = \frac{adj}{hyp}$

$\cos 30° = \frac{x}{60}$

$0.866 = \frac{x}{60}$

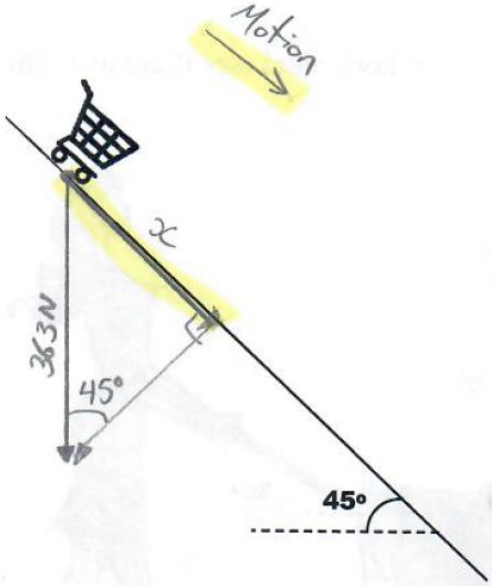
EF: $51.96_N = x$

WORK $= F \cdot d$

$= 51.96\ (78)$

$= 4053\ J$

2) A shopping cart with a mass of 37kg is found atop a hill with an incline of 45° (from horizontal). The begins to slide in the direction of the slope. *(diagram is not drawn to scale)*



$W = mg$

$W = 37(9.8)$

$W = 363\ N$

Using Trigonometry:

Calculate the effective force.
Calculate the work done if the cart travels a distance of 0.2km

SOH:

$\sin\theta = \frac{opp}{hyp}$

$\sin 45° = \frac{x}{363}$

$0.707 = \frac{x}{363}$

EF: $257_N = x$

$W = F \cdot d$

$W = 257\ (200)$

$W = 51400\ J$