Quiz 1
Math 202 F01

Name: Solutions
1/23/15

An object weighing 3 lbs is located at the point $A = (1, 0, 4)$, and is being pulled by a cable in the direction of the point $B = (0, -2, 2)$ with a force of 4 lbs.

1. Give, in coordinate form, a vector representing the force of gravity on the object.

Direction is downward, $\langle 0, 0, -1 \rangle$
& magnitude is 3 lbs so

$$\vec{F}_{grav} = 3\langle 0, 0, -1 \rangle = \langle 0, 0, -3 \rangle \text{ lbs}$$

2. Give, in coordinate form, a vector representing the force of the cable on the object.

Direction is that of $\vec{AB} = \langle 0-1, -2-0, 2-4 \rangle$
$= \langle -1, -2, -2 \rangle$

and magnitude is 4 lbs.

Since $\|\vec{AB}\| = \sqrt{1+4+4} = 3$

$$\vec{F}_{cable} = \frac{4}{3}\langle -1, -2, -2 \rangle = \left\langle -\frac{4}{3}, -\frac{8}{3}, -\frac{8}{3} \right\rangle$$

3. Give, in coordinate form, a vector representing the total force on the object.

$$\vec{F}_{grav} + \vec{F}_{cable} = \langle 0, 0, -3 \rangle + \left\langle -\tfrac{4}{3}, -\tfrac{8}{3}, -\tfrac{8}{3} \right\rangle$$

$$= \left\langle -\tfrac{4}{3}, -\tfrac{8}{3}, -\tfrac{17}{3} \right\rangle$$