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1.) Since there is ~~not~~ no friction,
net force will be equal to $F \cos x$,
 $F \cdot \cos x = ma$

$$100 * \cos 37^\circ = 40a$$

$$100 * 0.7986 = 40a$$

$$79.86 = 40a$$

$$a = 1.99 \text{ m/s}^2$$

2.) a) Yes, Earth exerts a gravitational force upon object at its surface

b) long range force

c) The magnitude of the force of gravity can be found by multiplying the mass m of the object by the magnitude of the acceleration a due to gravity g

$$= 9.8 \text{ ms}$$

The direction of the gravitational field is pointed towards the body that produces the field.

$$g = \frac{GM}{r^2}$$
$$g = \frac{9.8 \times 10^3 \times 1000}{(1000)^2}$$
$$g = \frac{9.8 \times 10^6}{10^6} = 9.8 \text{ ms}^{-2}$$

As the mass or distance increase, the force of gravity decreases. The force of gravity is directly proportional to the mass and inversely proportional to the square of the distance.