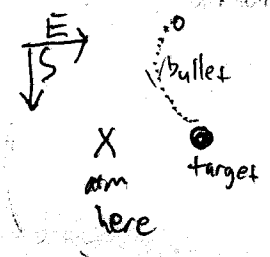
3] Alice and the jar are falling at the same speed with the same acceleration. When she lets go, the jar will not move relative to her. Someone on a shelf will see it fall.

13] Presumably, the block is so heavy that Gary does not move it, so he believes that it has no kinetic energy and it will continue to have no kinetic energy. Cindy sees it pass by with a constant velocity, so believes it has some K.E., but the K.E. is not changing.

23] If the woman on the train knows that she is on a train, she ~~will~~ should say that the ball has no ~~force~~ horizontal force acting on it. If she is deluded, she might believe that the ball is pulled away from her (but she will probably feel herself being pulled, as we all do in accelerating cars). The woman on the ground will agree - no horizontal force acts on the ball.

58] 

A South-moving object deflects Eastward if it is in the Southern hemisphere. A North-moving object deflects westward, which is to the left; again, aim right.

E 1] a.) $V_{\text{ground}} = V_{\text{from gun}} + V_{\text{car}} = 15 + 25 \text{ m/s} = 40 \text{ m/s}$

b.) $U = -V_{\text{gun}} + V_{\text{car}} = 10 \text{ m/s}$

(7)

11] The scale gives a reading equivalent to a force of $\vec{F}_s$. The total force on you is $\vec{F}_s$ plus $\vec{F}_{\text{gravity}}$. In this example, you are accelerating upward at $a = \frac{g}{2}$. That means:

$$\vec{F}_{\text{Total}} = m\frac{g}{2}\,(\text{up}) = \vec{F}_s - mg\,(\text{down})$$

$$\Rightarrow F_s = m\frac{g}{2} + mg = \frac{3}{2}mg = \boxed{900\ N}$$

16] The woman's mass is $\frac{600N}{g} = 60$ kg. If her acceleration is now $6\ m/s^2$, her 'weight' is $60 \cdot 6 = \boxed{360\ N}$

7] On the train, the suitcase appears motionless at first, K.E. = 0. The train, hence everything in it, moves at a constant speed, so there is no horizontal acceleration. The final velocity is only vertical (as observed on the train),

$V_f = 5$ m/s, $K.E._{\text{final}} = \frac{1}{2}mv^2 = \frac{1}{2}m(5\ m/s)^2 = \underline{25\ J} = \Delta KE$

19] $a = \frac{v^2}{r} = \frac{(20\ m/s)^2}{40\ m} = \underline{10\ m/s^2} \approx g$