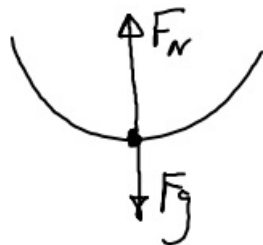•Determine the apparent weight of a 50 kg rider on a
roller coaster when the coaster is:
A) going through the bottom of a 30m radius valley at 25m/s.
B) Going through the top of a 7.0m radius loop at 11.7m/s.
C) Cresting a 20m radius hill-top at 14m/s.
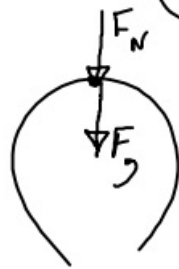
$$F_N = ? \quad m = 50 \text{ kg} \quad F_g = 490N$$

$$\Sigma F_c = \frac{m s^2}{r}$$

$$F_N - F_g = \frac{m s^2}{r}$$

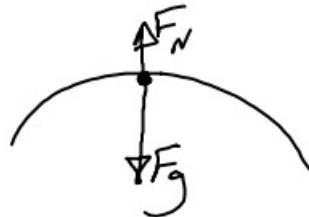$$F_N - 490 = \frac{(50)(25)^2}{30}$$

$$\boxed{F_N = 1532N}$$

B)

$$\Sigma F_c = \frac{m s^2}{r}$$

$$F_N + F_g = \frac{m s^2}{r}$$

$$F_N + 490 = \frac{50(11.7)^2}{7}$$

$$\boxed{F_N = 1468N}$$

C)

$$\Sigma F_c = \frac{m s^2}{r}$$

$$F_g - F_N = \frac{m s^2}{r}$$

$$490 - F_N = \frac{50(14)^2}{20}$$

$$\boxed{F_N = 0}$$