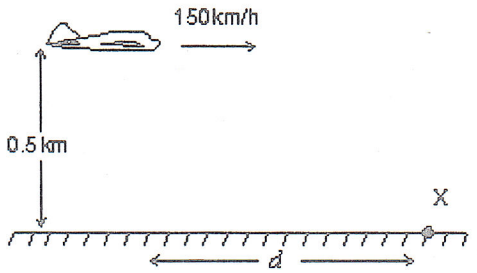
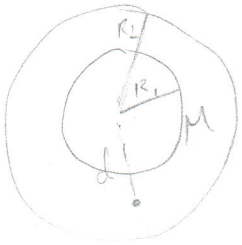
12. The airplane shown is in level flight at an altitude of 0.50 km and a speed of 150 km/h. At what distance d should it release a heavy bomb to hit the target X? Take $g = 10$ m/s^2.



A) 150 m
B) 295 m
C) 417 m
D) 2550 m
E) 15,000 m

13. A spherical shell has inner radius R_1, outer radius R_2, and mass M, distributed uniformly throughout the shell. The magnitude of the gravitational force exerted on the shell by a point mass particle of m a distance d from the center, outside the inner radius, is:

A) 0
B) GMm / R_1^2
C) GMm/d^2
D) $GMm/\left(R_2^2 - d^2\right)$
E) $GMm/(R_1 - d)^2$



14. The escape velocity at the surface of Earth is approximately 8 km/s. What is the mass, in units of Earth's mass, of a planet with twice the radius of Earth for which the escape speed is twice that for Earth?

A) 2
B) 4
C) 8
D) 1/2
E) 1/4