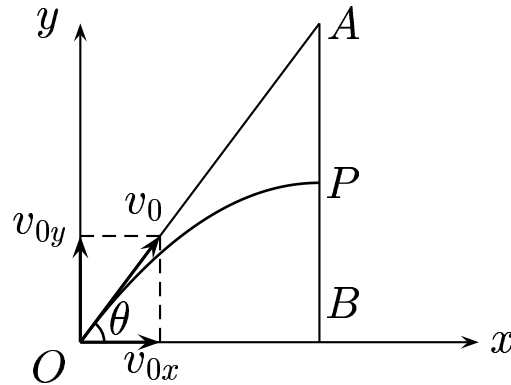


Consider a “Gun and Target” setup. Given:  $v_{0x} = 10 \text{ m/s}$  ,  $v_{0y} = 20 \text{ m/s}$  .  $OB = 20 \text{ m}$  ,  $AB = 40 \text{ m}$  ,  $g \approx 10 \text{ m/s}^2$ .



Find: The height  $BP$  as the bullet passes line  $AB$  .

- A)  $BP = 15 \text{ m}$
- B)  $BP = 20 \text{ m}$
- C)  $BP = 30 \text{ m}$

$$t = \frac{\overline{OB}}{v_{0x}} = \frac{20}{10} = 2.$$

$$BP = v_{0y} t_{BP} + \frac{1}{2}(-g) t_{BP}^2 = (20)(2) - \left(\frac{10}{2}\right) (2)^2 = 20 \text{ m} .$$

$$AP = \left(\frac{1}{2}\right) g t_{BP}^2 = \left(\frac{10}{2}\right) (2)^2 = 20 \text{ m} .$$

Answer **B**.