

STATICS $P_T = 0$

A 25 g sphere explosive breaks into 3 pieces: Use conservation of momentum to find the speed and direction of the third piece.

1: 8.0 g E35N 42 m/s $P_1 = (0.006)(42) = 0.252$

2: 11.0 g W21N 33 m/s $P_2 = (0.011)(33) = 0.363$

3: 8.0 g @ _____

$P_{1x} = 0.252 \cos 35 = +0.2064$

$P_{1y} = 0.252 \sin 35 = +0.1445$

$P_{2x} = 0.363 \cos 21 = 0.3389$

$P_{2y} = 0.363 \sin 21 = 0.1301$

$\Sigma x = 0 = P_{1x} + P_{2x} + P_{3x}$

$0 = 0.2064 + (-0.3389) + P_{3x}$

$0.3389 - 0.2064 = P_{3x}$

$+0.1325 = P_{3x}$

$\Sigma y = 0 = P_{1y} + P_{2y} + P_{3y}$

$0 = 0.1445 + 0.1301 + P_{3y}$

$-0.2746 = P_{3y}$

$P_3 = 0.3049 \text{ kg}\cdot\text{m/s} \text{ @ } 64.2^\circ \text{ S}$

$v_3 = \frac{P_3}{m_3} = \frac{0.3049}{0.008} = 38.1 \text{ m/s} \text{ @ } 64.2^\circ \text{ S}$

Mar 23-4:07 PM