What are the 3 rules of vector addition?

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What velocity does it hit at?

How far did it fall?

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What velocity does it hit at?

$v_2 = v_1 + at = (-7.3 \text{ m/s}) + (-9.8 \text{ m/s}^2)(2.0 \text{ s}) = -27 \text{ m/s}$

How far did it fall?

$d = \bar{v}t = [-7.3 \text{ m/s} + (-27 \text{ m/s})]/2 \ (2.0 \text{ s}) = -34 \text{ m}$

What is the vertical and horizontal component of a ball thrown at 22 m/s at an angle of 33^0 with the ground? a) How long does it take to get to the top of its path? b) How high did it go?

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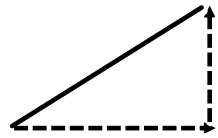

$v_y = \sin 33(22\ m/s) = 12\ m/s$

$v_x = \cos 33(22\ m/s) = 18\ m/s$

$a = \Delta v/t$

$t = \Delta v/a$

$t = (0 - 12\ m/s)/(-9.8\ m/s^2)$

$t = 1.2\ s$

$d = \bar{v}t$

$d = [0 + (12\ m/s)]/2\ (1.2\ s) = 7.2\ m$

16 N at $20.^0$

45N at $110.^0$

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45N at $110.^0$

R = 48 N at 90^0

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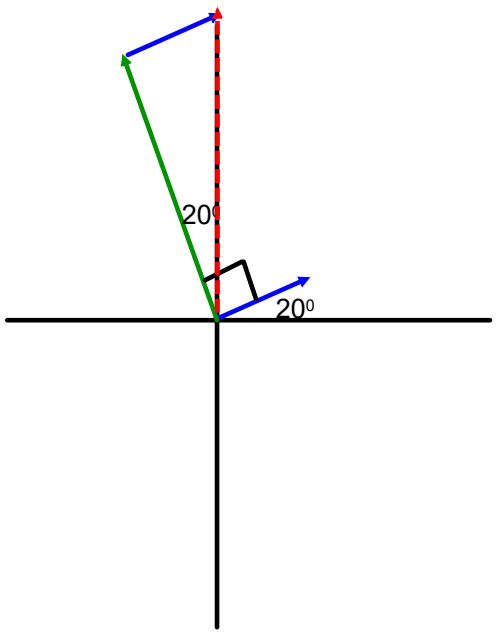
45N at $110.^0$

R = 48 N at 90^0



$3.4\ m/s^2\ 6.0^0$

$2.1\ m/s^2\ 276^0$

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$v_r = 4.0\ m/s^2$ at 335^0

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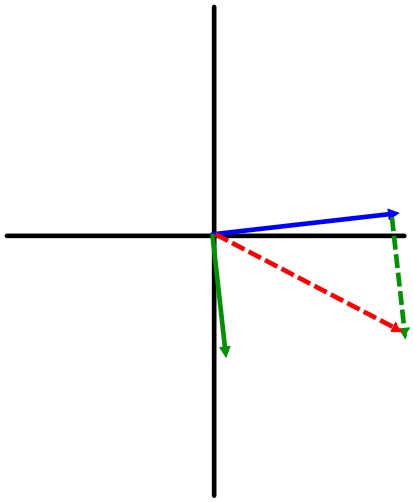

4500 Mm = _____ cm

.00023 μm = _____ km

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4500 Mm = 4.5×10^{11} cm

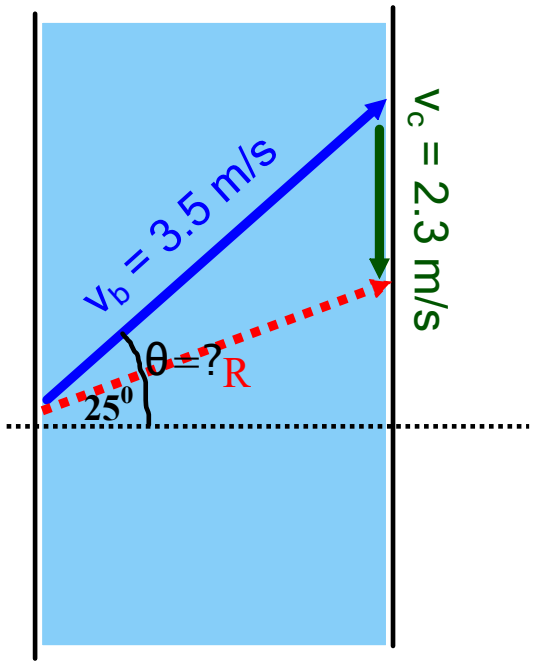
.00023 μm = 2.3×10^{-13} km

How would you draw your diagram if the boat wanted to end up 25^0 upstream?

θ=?

v_b = 3.5 m/s

v_c = 2.3 m/s



How would you draw your diagram if the boat wanted to end up 25^0 upstream?

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v_b = 3.5 m/s

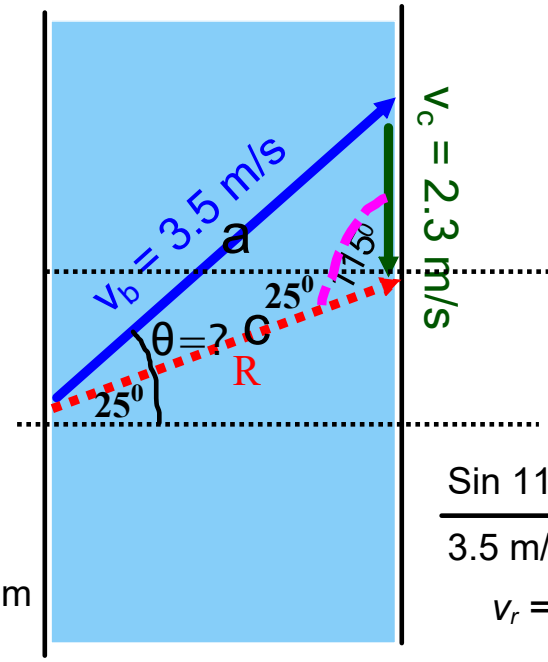
v_c = 2.3 m/s

$$\frac{\text{Sin A}}{a} = \frac{\text{Sin B}}{b} = \frac{\text{Sin C}}{c}$$

$$\frac{\text{Sin } 115}{3.5 \text{ m/s}} = \frac{\text{Sin B}}{2.3 \text{ m/s}}$$

B = 37^0

37+ 25 = 62^0 upstream



$$\frac{\text{Sin } 115}{3.5 \text{ m/s}} = \frac{\text{Sin } 28}{v_r}$$

v_r = 1.8 m/s

A plane (billy the plane, that is) wants to travel at 455 km/hr at 245'. Where should it head if it encounters a wind of 125 km/hr blowing from the South?

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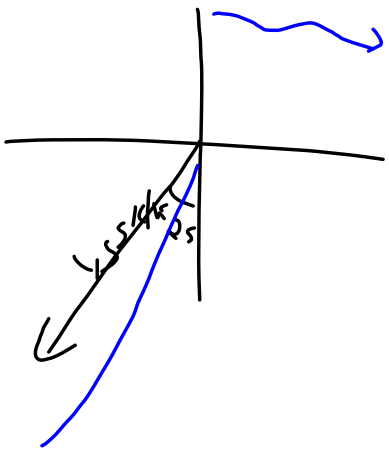
ends up at

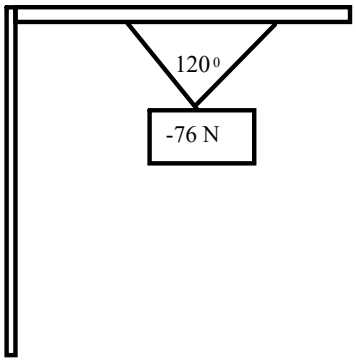
v_R = 455 km/hr at 245°

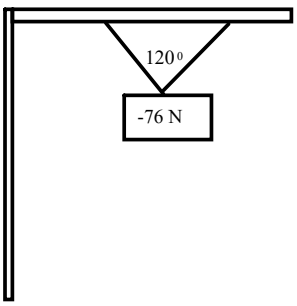
v_w = 125 km/hr at 90°

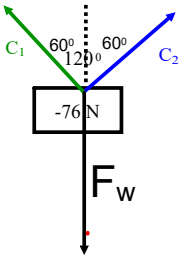
v_R = ?

v_p ?



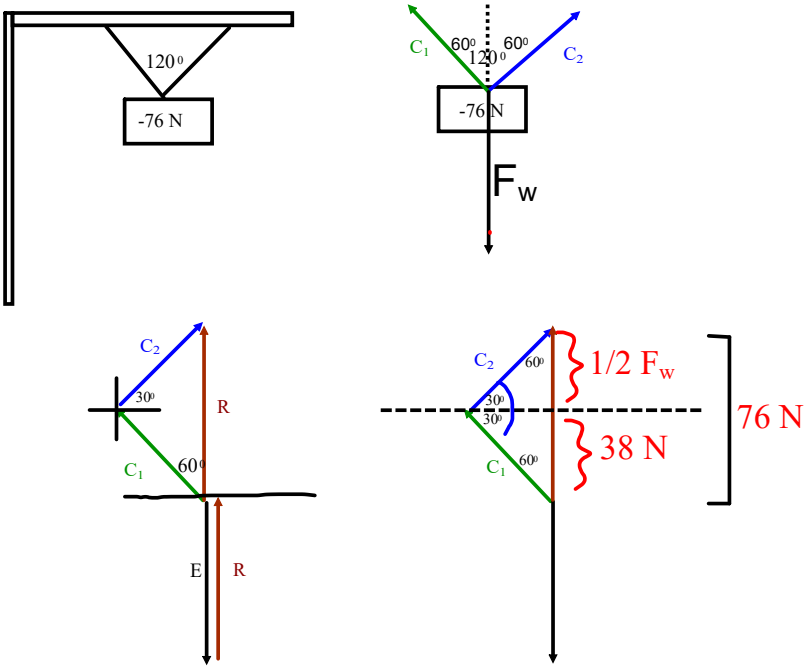






$\cos 60' = 76\ N/C_1$

$C_1 = 38\ N/\cos 50' = 59\ N$



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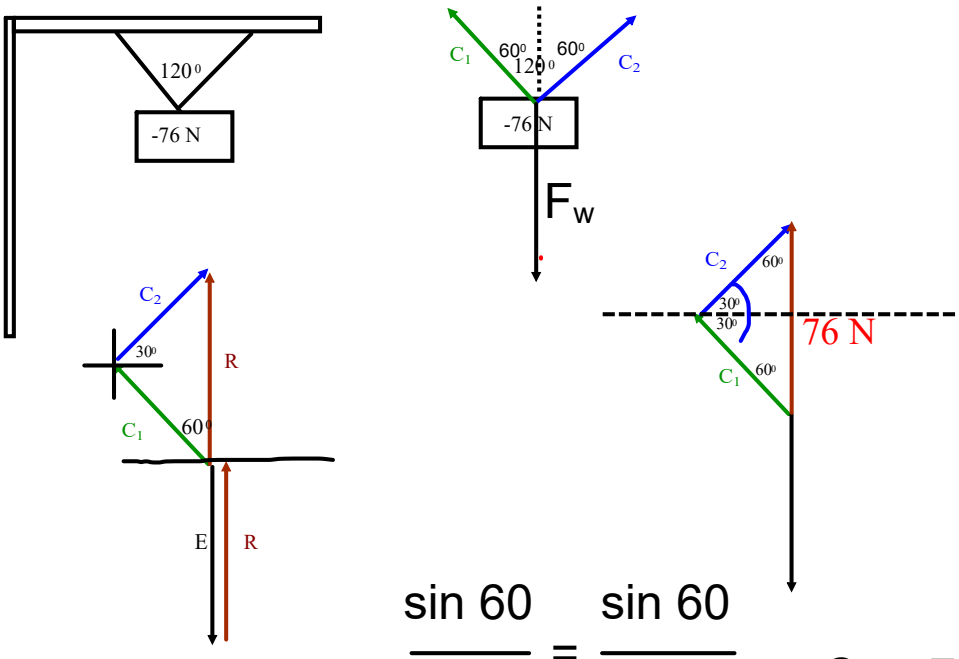

$$\frac{\sin 60}{76\ N} = \frac{\sin 60}{C_1} \qquad C_1 = 76\ N$$