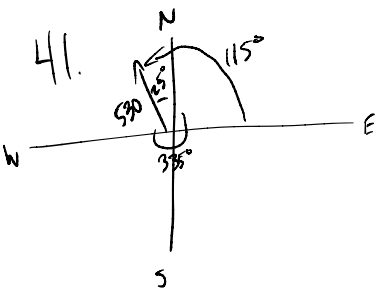
Pg. 512 #41-49 all

Will Dunning

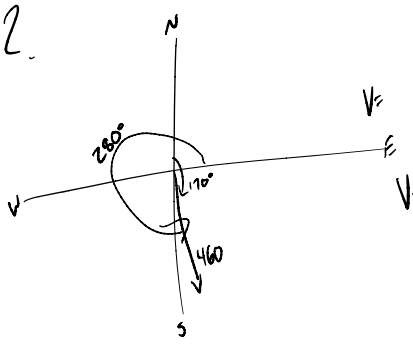
41.



$\langle 530\cos 115°, 530\sin 115° \rangle$

$\langle -223.99, 480.34 \rangle$

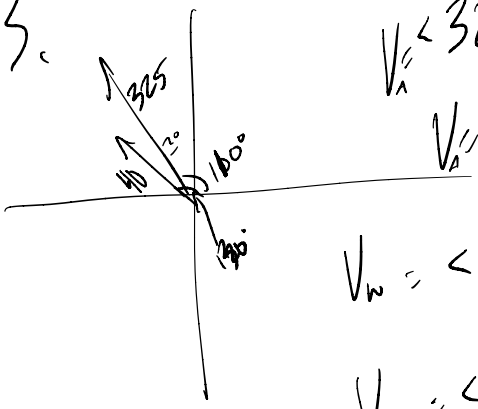
42.



$V = \langle 460\cos 280, 460\sin 280 \rangle$

$V = \langle 79.88, -453.01 \rangle$

43.



$V_A = \langle 325\cos 110°, 325\sin 110° \rangle$

$V_A = \langle -111.16, 305.4 \rangle$

$V_w = \langle 40\cos 130, 40\sin 130 \rangle$

$V_w = \langle -25.71, 30.64 \rangle$

$V_A + V_w = \langle 136.87, 336.04 \rangle$

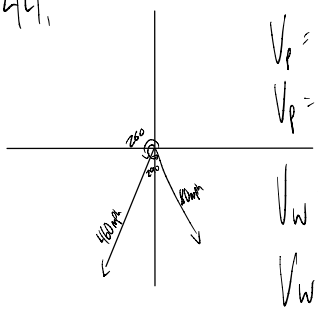
$V_g = \|V_g + V_w\| = \sqrt{(-136.87)^2 + (336.04)^2}$

$V_g = 362.84$ mph

$\tan\theta = \frac{336.04}{-136.87}$

bearing: 337.84°

44.



$V_p = \langle 460\cos 260, 460\sin 260° \rangle$

$V_p = \langle -79.88, -453.01 \rangle$

$V_w = \langle 80\cos 290, 80\sin 290 \rangle$

$V_w = \langle 27.36, -75.18 \rangle$

actual velocity vector: $\langle -52.52, -528.19 \rangle$

$V_g = \sqrt{(-52.52)^2 + (-528.19)^2}$

$V_g = 530.79$ mph

$\tan\theta = \frac{-529.19}{52.52}$

$\theta = -84.32$

Bearing: $174.32°$

45. $V = 10(\cos 70° i + \sin 70° j)$

$V = \langle 3.42, 9.4 \rangle$

b. hor. speed is 3.42 m/s

vert. speed is 9.4 m/sec but will change w/ gravity's effects.

46. $V = 2.5(\cos 15 i + \sin 15 j)$

$V = \langle 2.41, 0.65 \rangle$

horiz. comp. is 2.41 lbs,
vert is 0.65 lbs.

47. $= k\langle \cos 33° \sin 33° \rangle$

ca, b7 $= k\cos(33° - 15°)$

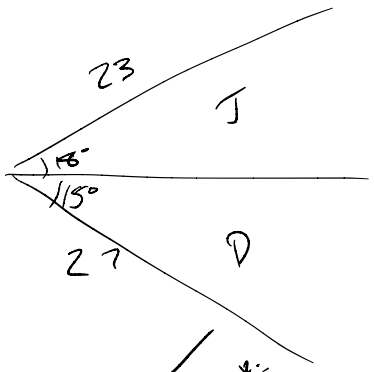
$= k\cos(18°)$

$2.5 = k\cos(18)$ $\quad k = \frac{2.5}{\cos 18} = 2.63$

$W = 2.63(\cos 33° i + \sin 33° j)$

$W = \langle 2.21, 1.43 \rangle$

46.



$j = \langle 23\cos 18, 23\sin 18 \rangle$

$\langle 21.87, 7.11 \rangle$

$d = \langle 27\cos 15, 27\sin 15 \rangle$

$\langle 26.08, -6.99 \rangle$

$c = \sqrt{(47.95)^2 + (0.12)^2} = 47.95$ lbs.

total $\langle 47.95, 0.12 \rangle$

appl. for dog.

49. $F = (50\cos 45 + 50\sin 45) + (75\cos(-30) + 75\cos 30)$

$F = \langle 100.3, -2.14 \rangle$

$\|F\| = \sqrt{(100.3^2) + (-2.14)^2} = 100.3$ lbs.

$\tan\theta = \frac{-2.14}{100.3} = 1.22°$