

## Brown University Vector Boot Camp - Practice Solutions

- $\langle 20, 20\sqrt{3} \rangle$
  - $\langle 1, -3\sqrt{3} \rangle$
  - 60
  - 60
  - $4\sqrt{3}$
  - $\pi/6$
- $\langle 8, 9, 3 \rangle$
  - $\langle -41, 14, -43 \rangle$
  - $\sqrt{74}$
  - 19
  - $\langle 33, -17, -37 \rangle$
  - $\langle -33, 17, 37 \rangle$
  - $-10 \langle 33, -17, -37 \rangle = \langle -330, 170, 370 \rangle$
- $18/\sqrt{66}$
  - $\langle 9/7, 18/7, 27/7 \rangle$
  - $\langle -15/11, 12/11, 15/11 \rangle + \langle 26/11, 10/11, 18/11 \rangle$
- $\sqrt{34}$  miles
  - $\arccos(4/\sqrt{17})$
- $(50\sqrt{3} - 50)$  pounds and  $(25\sqrt{6} - 25\sqrt{2})$  pounds
- $\langle -2/7, -6/7, 3/7 \rangle$
  - $\langle 21/\sqrt{850}, 3/\sqrt{850}, 20/\sqrt{850} \rangle$  and  $\langle -21/\sqrt{850}, -3/\sqrt{850}, -20/\sqrt{850} \rangle$
- $\sqrt{14}, 3\sqrt{6}, 3\sqrt{21}$
  - The dot product of each pair of vectors is zero.
  - $\sqrt{14} \cdot 3\sqrt{6} \cdot 3\sqrt{21} = 378$
  - $|\langle 4, -16, -22 \rangle \cdot \langle -2, 8, 11 \rangle| = 378$