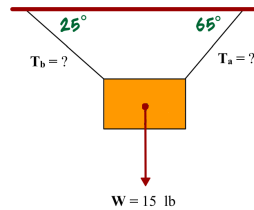


## Section 9.1 and 9.2 Problems

- Is the quantity a vector or a scalar?
  - The volume of a sphere.
  - The velocity of a car traveling 55mph north.
  - The speed of a car traveling 55mph.
  - The mass of an object (say 10kg).
  - The weight of an object (say 90lb).
- Let  $\vec{v} = \overrightarrow{PQ}$  where  $P = (-2, 5)$  and  $Q = (1, -2)$ . Which of the following vectors with the given initial and terminal points are equivalent to  $\vec{v}$ ?
  - $(-3, 3)$  and  $(0, 4)$
  - $(0, 0)$  and  $(3, -7)$
  - $(-1, 2)$  and  $(2, -5)$
  - $(4, -5)$  and  $(1, 4)$
- Express  $\vec{u}$  as a linear combination  $\vec{u} = a\vec{v} + b\vec{w}$ . Then sketch the vectors  $\vec{u}$ ,  $\vec{v}$ ,  $\vec{w}$  and the parallelogram formed by  $a\vec{v}$  and  $b\vec{w}$ .
  - $\vec{u} = \langle 3, -1 \rangle$ ,  $\vec{v} = \langle 2, 1 \rangle$ ,  $\vec{w} = \langle 1, 3 \rangle$ .
  - $\vec{u} = \langle 6, -2 \rangle$ ,  $\vec{v} = \langle 1, 1 \rangle$ ,  $\vec{w} = \langle 1, -1 \rangle$
- What are the tensions in the ropes suspending the 15lb object?



- Find the lengths of a triangle with vertices  $(1, 1, 1)$ ,  $(2, -5, 4)$  and  $(3, 3, -5)$ . Sketch the triangle in  $\mathbb{R}^3$ .
- Find a vector in the opposite direction of  $\vec{v} = \langle 10, 1, -6 \rangle$  with magnitude 20.
- For the vectors  $\vec{u} = \vec{i} + 4\vec{j}$  and  $\vec{v} = \langle -3, 4 \rangle$ , calculate
  - $|\vec{u} - 2\vec{v}|$
  - $\frac{-3\vec{v}}{|\vec{u} + \vec{v}|}$
  - $||\vec{u}|\vec{v}|$