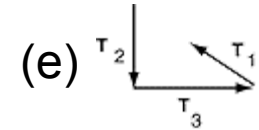
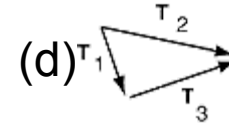
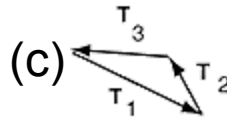
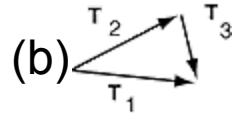
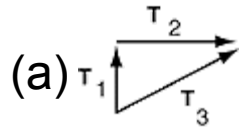


1. For which of the vector diagram it is true that  $\vec{T}_1 - \vec{T}_2 = \vec{T}_3$



**Correct answer is (b).** You can see from the picture that  $T_1 = T_2 + T_3$

2. An object is shot upward at 34.3 m/s. How high does it go?

- (a) 60.0 m    (b) 180.1 m    (c) 120.0 m    (d) 102.9 m    (e) 35.0 m

$$V^2 - V_0^2 = -2g\Delta y \quad V=0 \text{ at the top} \rightarrow V_0^2 / 2g = \Delta y \rightarrow \Delta y = 34.3^2 / (2 * 9.81) \text{ m} = 60.0 \text{ m}$$

**Correct answer is (a)**

3. A vector makes an angle of  $60^\circ$  with the x axis of a coordinate system. Which of the following statements is true ( $V_x$  and  $V_y$  are the x and y components of the vector,  $V$  is the magnitude of the vector)

- (a)  $V_x > V_y$     (b)  $V_y > V_x$     (c)  $V_y > V$     (d)  $V_x > V$

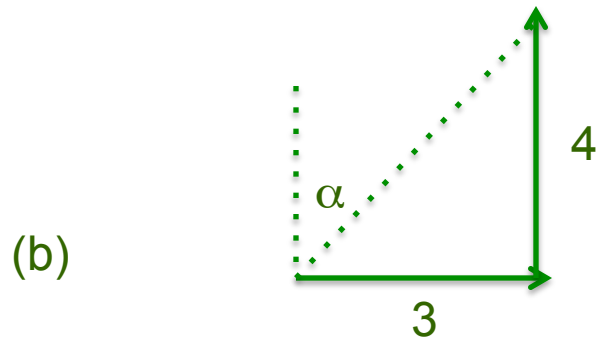
$$V_x = V \cos 60 \text{ and } V_y = V \sin 60$$

$\sin 60$  and  $\cos 60$  are  $< 1$ , therefore (c) and (d) are wrong.

Also  $\sin 60 > \cos 60 \rightarrow$  **Correct answer is (b)**

4. A car travels due east for a distance of 3 miles and then due north for an additional 4 miles before stopping. What is the angle  $\alpha$  of the shortest path relative to due north?

(a)  $\alpha = \cos^{-1}(3/5)$    (b)  $\alpha = \sin^{-1}(5/3)$    (c)  $\alpha = \sin^{-1}(4/3)$    (d)  $\alpha = \tan^{-1}(3/4)$



$3 = 4 \tan \alpha \rightarrow$  correct answer is (d)

5. If the acceleration vector of a body is perpendicular to the velocity vector, which of the following must be true?

(a) Only the speed is changing                      (b) Only the direction is changing  
(c) Both speed and direction are changing      (d) Speed and direction are not changing

Correct answer is (b). See the last paragraph of Section 3.5 in the book