

Solutions

Each answer shows the steps, then the **result**.

2.1

(a)

- scalar

(b)

- vector

(c)

- scalar

(d)

- vector

2.2

- $A_x = 20 \cos 60^\circ = 10 \text{ m}$; $A_y = 20 \sin 60^\circ = 17 \text{ m}$

2.3

- $A = \sqrt{6^2 + 8^2} = \sqrt{100} = 10$

2.4

- $(5 - 1, 2 + 3) = (4, 5)$; magnitude $= \sqrt{4^2 + 5^2} = \sqrt{41} \approx 6.4$

3.1 C

- acceleration is a vector; the others are scalars

3.2 B

- $12 \cos 30^\circ = 10.4$

3.3

(a)

- $A = \sqrt{9^2 + 12^2} = \sqrt{225} = 15$

(b)

- $\theta = \tan^{-1}(12/9) = 53^\circ$

3.4

(a)

- $(4, -3) \text{ m s}^{-1}$

(b)

- magnitude $\sqrt{4^2 + 3^2} = 5 \text{ m s}^{-1}$; direction $\tan^{-1}(3/4) = 37^\circ$ below the x -axis