

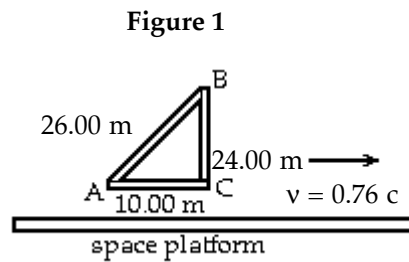
## PHYSICS 6C PRACTICE QUIZ 8

THE FOLLOWING MULTIPLE CHOICE QUESTIONS ARE NOT TO BE TURNED IN FOR GRADING. THEY ARE INTENDED AS A SELF EVALUATION QUIZ AND PRACTICE FOR THE FINAL EXAM

MULTIPLE CHOICE. Choose the ONE alternative that BEST completes the statement or answers the question.

- 1) A certain astronomical telescope has a diameter of 5.60 m. What is the minimum angle of resolution for this telescope at a wavelength of 620 nm?
- A)  $1.11 \times 10^{-7}$  rad
  - B)  $3.11 \times 10^{-7}$  rad
  - C)  $2.70 \times 10^{-7}$  rad
  - D)  $1.35 \times 10^{-7}$  rad
  - E)  $4.05 \times 10^{-7}$  rad

2)



- A right-angled construction frame ABC, when measured at rest, has dimensions as follows:  $AB = 26.00$  m,  $AC = 10.00$  m, and  $BC = 24.00$  m. The frame is given a velocity of  $0.76 c$ , relative to the space platform, in a direction parallel to AC. The dimensions of the moving frame are measured simultaneously by observers on the platform. In Figure 1, the length AB measured by these observers is closest to:
- A) 24.9 m
  - B) 25.4 m
  - C) 24.3 m
  - D) 23.7 m
  - E) 26.0 m
- 3) An electron has a speed of  $0.783 c$ . Through what potential difference would the electron need to be accelerated in order to reach this speed? Assume that the electron was initially at rest.
- A) 310 kV
  - B) 260 kV
  - C) 360 kV
  - D) 400 kV
- 4) A particle has speed  $0.95 c$  and total energy  $4.8 \times 10^{-10}$  J. What is its momentum?
- A)  $1.5 \times 10^{-18}$  kg  $\cdot$  m/s
  - B)  $2.5 \times 10^{-15}$  kg  $\cdot$  m/s
  - C)  $5.6 \times 10^{-13}$  kg  $\cdot$  m/s
  - D)  $1.0 \times 10^{-9}$  kg  $\cdot$  m/s

- 5) When you decrease, by a factor of two, the wavelength of the light causing photoelectrons to be emitted from a metal surface, the kinetic energy of the photoelectrons will
- A) decrease by a factor of 2.
  - B) double
  - C) more than double.
  - D) increase by a factor of  $\sqrt{2}$ .
  - E) decrease by a factor of  $\sqrt{2}$ .
- 6) A photocathode whose work function is 2.9 eV is illuminated with white light that has a continuous wavelength band from 400 nm to 700 nm. The range of the wavelength band in this white light illumination for which photoelectrons are not produced, in nm, is closest to:
- A) 430 to 700
  - B) 400 to 480
  - C) 430 to 480
  - D) 400 to 430
  - E) 480 to 700