

# Fundamentals of Surveying

## Sample Examination

Third Edition

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# Afternoon Session Sample Examination

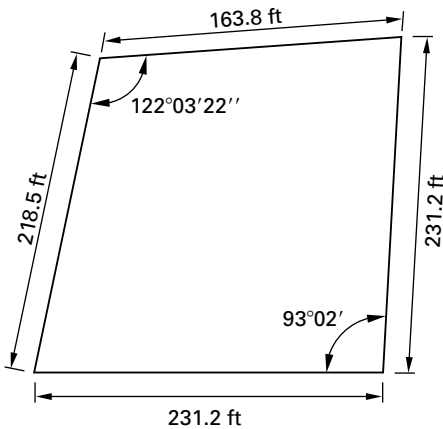
**86.** What is the area of the sector of a circle with a radius of 60 ft and a central angle of  $60^\circ$ ?

- (A) 62.83 ft<sup>2</sup>
- (B) 1884.96 ft<sup>2</sup>
- (C) 5654.87 ft<sup>2</sup>
- (D) 11,309.73 ft<sup>2</sup>

**87.** What is the grade of a section of highway that has a centerline elevation of 114.50 ft at station 10+15.00 and a centerline elevation of 142.20 ft at station 22+25.00?

- (A) 1.3%
- (B) 2.3%
- (C) 2.8%
- (D) 3.3%

**88.** What is the area of the following quadrilateral?

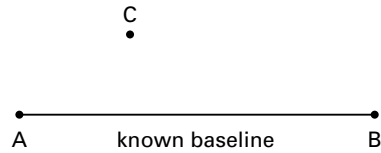


- (A) 39,842 ft<sup>2</sup>
- (B) 40,652 ft<sup>2</sup>
- (C) 41,856 ft<sup>2</sup>
- (D) 41,652 ft<sup>2</sup>

**89.** A 1000 ft long earthen berm has a cross section with an area of 1500 ft<sup>2</sup> at one end and 2000 ft<sup>2</sup> at the other end, with area increasing at a constant rate. What is the approximate volume of material in the berm?

- (A) 55,556 yd<sup>3</sup>
- (B) 62,742 yd<sup>3</sup>
- (C) 64,815 yd<sup>3</sup>
- (D) 74,074 yd<sup>3</sup>

**90.** In the situation shown, which method could be used to locate Point C in relation to Points A and B, using only an EDM?



- (A) traverse
- (B) bearing-bearing intersection
- (C) triangulation
- (D) distance-distance intersection

**91.** Which of the following is the best definition of *mean sea level*?

- (A) a plane halfway between mean high water and mean low water
- (B) a plane halfway between mean higher high water and mean lower low water
- (C) National Geodetic Vertical Datum of 1929
- (D) the average of all the water heights over a tidal epoch

**92.** On a topographic map, which of the following is correct?

- (A) Contour lines crossing streams form V's that point upstream.
- (B) Contour lines crossing streams form V's that point downstream.
- (C) Contour lines crossing ridges form U's that point up the ridge.
- (D) Both (A) and (C) are true.

**93.** What is the effect on the location of a coastal boundary when natural and gradual changes occur to the shoreline?

# Solutions

## Afternoon Session

**86.** area of circle =  $\pi r^2$   
 area of the required sector =  $\left(\frac{60^\circ}{360^\circ}\right) \pi(60 \text{ ft}^2)$   
 = 1884.96 ft<sup>2</sup>

The answer is B.

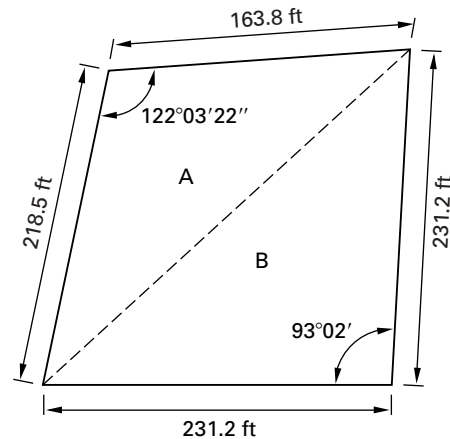
**87.**

elevation	station
114.50 ft	10+15.00
142.20 ft	22+25.00
$\Delta + 27.70 \text{ ft}$	12+10.00

$$\begin{aligned} \text{grade} &= \frac{27.70 \text{ ft}}{1210.00 \text{ ft}} \\ &= 0.023 \\ &= 2.3\% \end{aligned}$$

The answer is B.

**88.** area of triangle A =  $\frac{1}{2}ab \sin C$   
 = (163.8 ft)(218.5 ft)  
 × (sin 122°03'22'')/2  
 = 15,166.65 ft<sup>2</sup>  
 area of triangle B =  $\frac{1}{2}ab \sin C$   
 = (231.2 ft)(231.2 ft)  
 × (sin 93°02')/2  
 = 26,689.27 ft<sup>2</sup>  
 total area = 15,166.65 ft<sup>2</sup> + 26,689.27 ft<sup>2</sup>  
 = 41,855.93 ft<sup>2</sup>



The answer is C.

**89.**

$$\begin{aligned} V &= l \left( \frac{A_1 + A_2}{2} \right) \\ &= (1000 \text{ ft}) \left( \frac{1500 \text{ ft} + 2000 \text{ ft}}{2} \right) \\ &= 1,750,000 \text{ ft}^3 \\ \frac{1,750,000 \text{ ft}^3}{\frac{27 \text{ ft}^3}{1 \text{ yd}^3}} &= 64,815 \text{ yd}^3 \end{aligned}$$

The answer is C.

**90.** A distance-distance intersection could be used to locate Point C in relation to the baseline AB, using only an EDM.

The answer is D.

**91.** Mean sea level is a local datum and is the average of all the water heights over a 19-year tidal epoch.

The answer is D.

**92.** On a topographic map, contour lines crossing streams form V's that point upstream.