LS Review
General Questions

1. A self-reading rod, as is used for differential leveling, eliminates the need for:
   a. A rear rodman
   b. Balancing the backsights and foresights
   c. A level
   d. Subtracting the rod readings
   e. A vernier

2. A property parcel which borders on a small non-navigable stream will usually be bounded by
   a. Mean low water
   b. The thread of the stream
   c. The mean high water line
   d. The deepest part of the channel I
   e. The flood line

3. An Ephemeris would be necessary when
   a. Setting slopes in the field
   b. Using a Rhode' s Arc
   c. Using a Beaman Arc
   d. Making solar calculations
   e. Reducing survey data t o the California Coordinate System

4. The boundaries of the U.S. Public Lands, when approved and accepted by the proper U.S. Government agency, are generally unchangeable, except in which of the following cases?
   a. Junior rights are interfered with
   b. Adjacent property owners file suit against the government
   c. Mexican Land Grants are interfered with
   d. When the statutory Period of compliance has elapsed
   e. When a dependent resurvey shows the distance between section corners to actually be 81.00 chains.

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5. A field at an elevation of 2500 feet AMSL appears on a vertical photo taken at an altitude of 12,000 feet AMSL with a camera that has an 8.250 inch focal length. An electronic planimeter takes 5 readings on the field of 6.175, 6.185, 6.200, 6.170 and 6.160, (inches^2). What is the area on the ground of the field, in acres?

   a. 592 sq ft
   b. 56900 sq ft
   c. 188 acres
   d. 300 acres
   e. 365 acres

6. A centerline has a horizontal curve with a radius of 600.00 feet beginning at station 2+50 and ending at station 7+25.45. A straight stretch of water line goes from 50′ lt of 3+50 to 50′ Rt of station 5+00. What is the pipe length?

   a. 150.0 ft
   b. 165.2 ft
   c. 179.5 ft
   d. 185.4 ft
   e. 250.5 ft

7. For Navigable waters the following are true:

   a. The federal government owns the underlying land
   b. The State of California owns to the high water mark
   c. Riparian owners own the underlying land, but the state has rights to the water
   d. The federal government has control over the waterway
   e. The State of California owns from the high water mark to the low water mark

8. You are doing a GPS survey and have established coordinates for Point "Bradley" in CCS Zone 5, which is in Monterey County. Your survey is continuing onto King City, so you want to get onto CCS Zone 4 before you continue. What must you do?

   a. Change your Scale Factor and Convergence angle to Zone 4
   b. Continue with your survey; use the program Corpscon to convert the values you get in King City.
   c. King City is in Zone 4, so you don't have to do anything.
   d. Convert Bradley to Latitude and Longitude using Zone 5 values, then convert to CCS using Zone 4 values.
   e. The survey is being done with GPS, which does not require you to convert to Zone 4.

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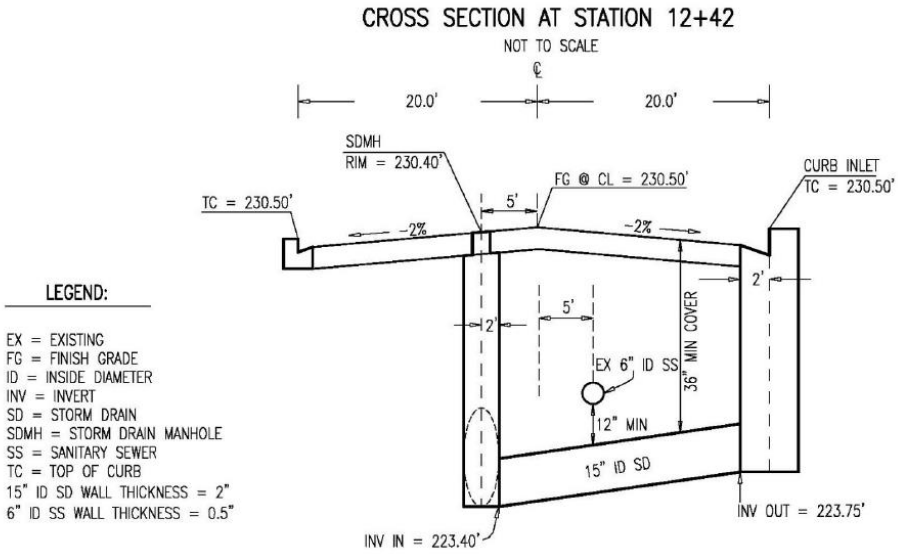
9. You have a map that shows the grid bearing and grid distance between Point "Alpha" and Point "Dog" to be N 01° 14′ 56″ W 4,560.234 meters. On the map there is a statement that the combined scale factor is 0.99985623 and the convergence angle is -1° 31′ 55″. The elevation at "Alpha" is 2345.67 feet, and the elevation at "Dog" is 1299.032 feet. What is the geodetic azimuth and ground distance in U.S. survey feet?

   a. 0° 16′ 59″ 14959.22 sFt.
   b. 0° 16′ 59″ 14,963.51 sFt.
   c. 2° 46′ 51″ 14,959.22 sFt.
   d. 357° 13′ 09″ 14,963.52 sFt.
   e. 358° 45′ 04″ 14,961.37 sFt.

10. You have been hired to provide construction staking for a new storm drain project within an existing street. The attached cross section is from the approved design plans. During excavation, the top of the existing 6″ID sanitary sewer was discovered to be at elevation 226.35′. What is the clearance between the bottom of the existing 6″ID sanitary sewer and the top of the proposed 15″ID storm drain?

    a. 0.82′
    b. 0.86′
    c. 1.00′
    d. 1.07′



11. The individual authorized by the Federal Emergency Management Administration (FEMA) to issue flood plain certificates on property in subscribing jurisdictions is the:

    a. local flood plain administrator
    b. local surveyor, engineer or architect
    c. clerk of the county court
    d. local county commissioner

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12. Your client requests a conference with you to discuss the relationship between boundary locations and fences. You should advise the client that fences have control as to boundary location when:
    a. the fences exist along the property lines of adjoiners whose property was simultaneously created
    b. they are less than 20 years old from the time of the original survey
    c. the adjacent owners, as arbitrated by the surveyor, decide that the location is controlling
    d. the fences were built in accordance with the original survey and no original or other monuments exist

13. You are a surveyor who has prepared an "as-built" plan, without certification, for a developer showing the recently completed improvements on a parcel of land with relationships to the boundary lines. The developer now asks you to certify the boundary locations in order to obtain an insurance policy. If another surveyor had done the original boundary line work for that parcel, you should provide the certification if:
    a. the original surveyor has a good reputation
    b. the developer allows you to resurvey the boundary line
    c. your legal counsel so advises
    d. the original surveyor's work was performed in recent times so that it is subject to current standards of practice

14. You have a written survey agreement with a client to survey a 10-acre parcel of land for a set fee. After obtaining a deed and survey for the parcel you are to survey, you also obtain adjoining deeds on all sides. You find serious discrepancies between the available records. After beginning the fieldwork, you feel you will be able to solve the problems, but only after extensive work. You should:
    a. consult your attorney before proceeding
    b. tell your client's attorney you will require more money to complete the job
    c. inform your client of the situation and state that the original fee is no longer applicable
    d. proceed with the survey and bill only the original fee

15. There exists an obvious error in the calls of a patent. This error became apparent during a survey in which all the original corners involved were found. Which of the following is true concerning this situation?
    a. The problem must be corrected by the surveyor, who will be governed by the Manual of Instructions for the Survey of the Public Lands of the United States, 1973.
    b. The calls in the patent will control because they indicate intent.
    c. The original comers must be adjusted to conform to the description in the patent.
    d. The original comers are unchangeable and will control.

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16. On an ALTA/ACSM survey, you find a building that overlaps the property boundary. For this situation, on the survey map, you show it as:
    a. an adverse possession
    b. a prescriptive easement
    c. an encroachment and dimension it
    d. a license to possess

17. Under a state plane coordinate system, grid azimuth would equal geodetic azimuth at a survey station located:
    a. along an agonic line
    b. on the central meridian of the zone
    c. along any principal meridian of the U. S. Rectangular Survey System
    d. on one of the lines of intersection of the developable surface with the sea level surface of the earth

18. What is the datum used for the GPS Navigation message
    a. NAD83 (CORS96)
    b. NAD27
    c. GRS80
    d. WGS84 (G1150)

19. What is the advantage available using a dual frequency GPS receiver that is not available using a single frequency GPS receiver?
    a. A single frequency GPS receiver cannot collect enough data to perform single, double or triple difference solutions
    b. A dual frequency receiver affords an opportunity to tract the P code but a single frequency receiver does not.
    c. A dual frequency receiver has access to the navigation code, a single frequency does not
    d. Over long baselines, a dual frequency receiver has the facility of modeling and virtually removing the ionospheric bias, whereas a single frequency receiver cannot.

20. When is it proper to apply proportionate measurement to the location of property corners?
    a. To distribute a few feet of gap found to exist between a subdivision boundary and the boundary of the original tract.
    b. When relocating lost corners in a sequence conveyance.
    c. When relocating lost corners in a platted subdivision.
    d. As the last resort.
    e. None of the above.

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The diagram below represents your survey of Block 2 of the First Addition to the City of Ocean View, California. This subdivision was originally monumented only at the block corners with iron pipes that were all found in good condition. The subdivision map contains a note on it indicating that all lots are 200' x 200' and that the streets run North and East.

The original purchaser of Lot 1 conveyed portions of the lot as follows:

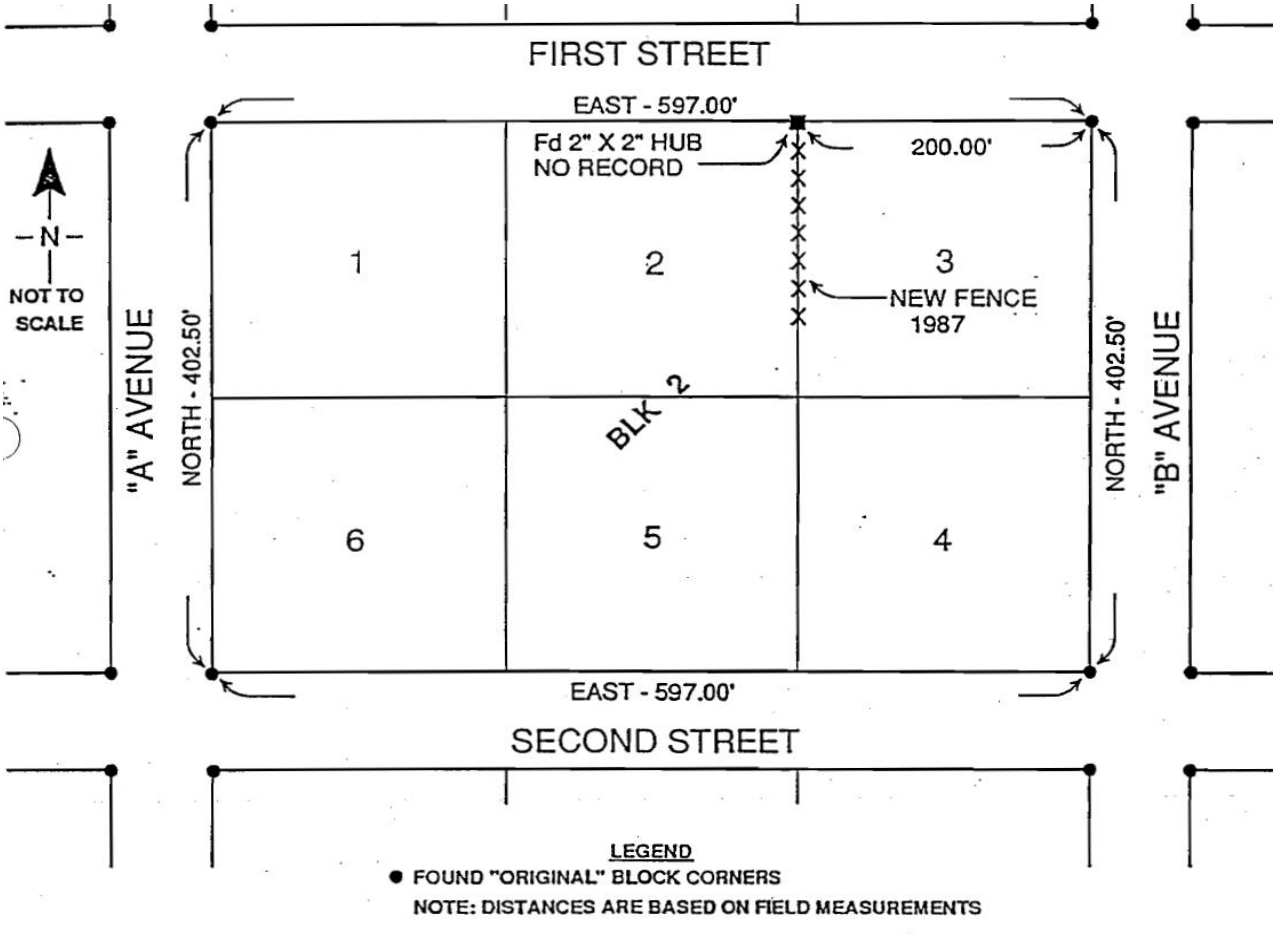
1921-conveyed the following (preamble omitted):

Beginning at the Southeast corner of First Street and "A" Avenue; thence, East along the North line of Lot I, 65.00 feet; thence, South, at right angles, 200.00 feet; thence, West, at right angles, to '"A" Avenue; thence North along "A" Avenue to the point of beginning.

1937-conveyed the following to the owner of Lot 2 (preamble omitted):

The East 5.00 feet of Lot 1 .

1988-conveyed the following to your client (preamble and recording references omitted):
Lot I, excepting those portions conveyed in 1921 and 1937.



Answer the following three questions based on the information above.

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21. What would be the most appropriate way to establish the northeast corner of Lot 1
    a. Measure 200 feet from the northwest corner along the south right of way of First Street
    b. Measure 199 feet from the northwest corner along the south right of way of First Street
    c. Measure 198.5 feet from the northwest corner along the south right of way of First Street
    d. Measure 200 feet from the found 2 x 2 hub
    e. Measure 199 feet from the 2 x 2 hub

22. What is the distance from the northwest corner of Lot 1 to your clients northeast corner
    a. 200.00 feet
    b. 195.00 feet
    c. 194.00 feet
    d. 193.50 feet
    e. 199.00 feet

23. What is the area of your clients property?
    a. 40,000 sq. ft.
    b. 40,049 sq. ft.
    c. 26,000 sq. ft.
    d. 25,961 sq. ft.
    e. 26,042 sq. ft.

24. When establishing the position of a lost corner through a curve in a subdivision, the error should be
    a. Prorated along the tangents
    b. Prorated along the arc
    c. Prorated along the chord
    d. All of the above will give you the same position.

25. Which of the following errors are not reduced by using DGPS or RTK methods?
    a. Atmospheric errors
    b. Satellite clock bias
    c. Ephemeris bias
    d. Multipath

POTPOURRI

#5 $\text{AREA}_{\text{GROUND}} = \text{AREA}_{\text{PHOTO}} \times \left(\frac{1}{\text{SCALE}}\right)^2$

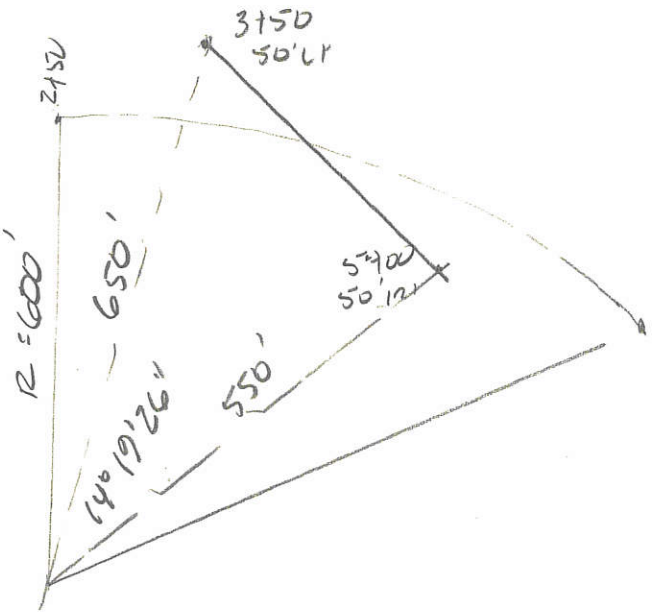
$\text{SCALE} = \frac{f}{H - h}$

$\text{SCALE} = \frac{8.25\text{ IN}}{12{,}000' - 2500'} \times \frac{1\text{ FT}}{12\text{ IN}} = \frac{1}{13{,}813}$

$\text{AREA}_{GR} = 6.178\text{ IN}^2 \times \left(\frac{1}{\frac{1}{13{,}813}}\right)^2 \times \frac{1\text{ FT}^2}{144\text{ IN}^2} \times \frac{1\text{ AC}}{43{,}560\text{ FT}^2}$

$= 188$ ACRES

#6



$L = R\,\Delta_{\text{RADIANS}}$

$\Delta_{\text{RADIANS}} = \frac{L}{R} = \frac{150}{600} = 0.25 = 14°19'26"$

$\cos_A = \frac{b^2 + c^2 - a^2}{2bc}$

$a^2 = b^2 + c^2 - 2bc\cos A$

$= 650^2 + 550^2 - 2 \cdot 650 \cdot 550 \cdot \cos(14°19'26")$

$= 32{,}227.62$

$a = 179.52$

#9.

$GRID_{AZ} = GEODETIC - CONVERGENCE$

$GRID\ DIST = HOR\ GROUND\ DIST \times C.S.F$

$GEODETIC = GRID_{AZ} + CONVERGENCE$

$= 358°45'04'' + -1°31'55''$

$= 357°13'09''$

$GROUND\ DIST = \frac{GRID\ DIST}{C.S.F}$

$= \frac{4560.234_m}{0.99985623} \times \frac{39.37}{12}$

$= 14,963.52$

#10

TOTAL DISTANCE OF 15" S.D $= (20-2)+5-2) = 21'$

DISTANCE STA LEFT 15" TO ℄ OF 6" SS $(10-2)$ 8'

$\frac{0.35}{21} = \frac{x}{8}$ $x = 0.133$

INV 15" AT CROSS OF 6" $= 223.40 + 0.133 = 223.53$

TOP 15" $= 223.53 + 1.25 + 0.166 = 224.95$

BOTTOM 6" $= 226.35 - 0.5' - 0.04 - 0.04 = 225.77$

CLEARANCE $= 225.77 - 224.95 = 0.82'$