Engineering Graphics: In Class Work

Scales

1. Convert a representative fraction (RF) of 1:126,720 to Graphic Scale information. RF is in form 1:X where 1 inch on map = X inches on earth. Assume the simple graphic scale below is 1" long. What number (representing miles) should be written at the right end?

0
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2. Convert Graphic Scale information of 1"=500' to RF & Scale Factor (SF).

3. Determine the SF of the following scales
    a. 1: 100
    b. 1" = 2000'
    c. 3/8" = 1'
    d. 2 cm = 4 km
    e. 1 " = 5 miles

4. Convert the following scales
    a. 1:100 to Architectural and Civil Engineering
    b. 1" = 64' to Metric and Architectural
    c. 3/8" = 1' to Metric and Civil Engineering
    d. 1:633600 to Graphical (1" = X miles)
    e. 1:10000 to Graphical (2 cm = X km)

5. What is the RF of a map where 1° of latitude is 4.4"?

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Distance
1. A drawing scale is 1" = 200'. What side of an Engineer's Scale should you use to interpret distances on the drawing? (10, 20, 30, 40, 50, 60). What number will you read on the scale if you measure an object that is 2" long? What should you multiply that number by to obtain the actual size?

2. A drawing scale is 1" = 700'. What side of an Engineer's Scale should you use to interpret distances on the drawing? (10, 20, 30, 40, 50, 60). What number will you read on the scale if you measure an object that is 2" long? What should you multiply that number by to obtain the actual size?

3. What is the distance between two points at the following latitudes and longitudes? C is at $39^o30'$ latitude and 30° longitude. D is at 42° latitude and $25^o 20'$ longitude. Calculate the mile/o longitude at latitude 42°.

4. A drawing has a Metric scale of 1:800. An object on the drawing is 8 cm long. How long is the actual object?

5. A drawing has a Civil Engineering scale of 1" = 120'. An object on the drawing is 3.5" long. How long is the actual object?

6. A drawing has an Architectural scale of 1 1/2" = 1'. An object on the drawing is 3.5" long. How long is the actual object?

7. A drawing has a graphical scale where 1" = 2 miles. A distance on the map is 5.75 inches. How long is the actual distance?

8. A drawing has a graphical scale where 3 cm = 2 km. A distance on the map is 1 cm. How long is the actual distance?

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Printing
1. An object is 100' wide and 75' high. The typical scale for a drawing of this type of object is ¼" or 1/8" = 1'. The available sheet sizes are A (11"x8.5"), B (17"x11") & C (22"x17"). The print buffer is 0.5". (a) Pick the best scale and paper size for printing the drawing. (b) Determine the Drawing Text Size (DTS) if the printed text size is to be 0.125".

2. A drawing is 5800 by 4400 mm in model space. The available paper size if 841 by 1189 mm, with a print buffer of 12.7 mm. Identify a good metric scale to print the drawing on the available paper.

Direction

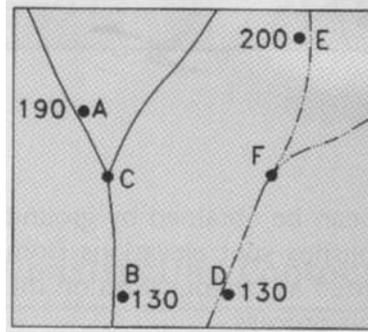1. Convert 321°34'54" to decimal degrees.

2. Convert N 99°21' to a Bearing.

3. Convert S 32°12' W to an Azimuth

4. What is the internal angle between N86°40'E & S10°40'E?

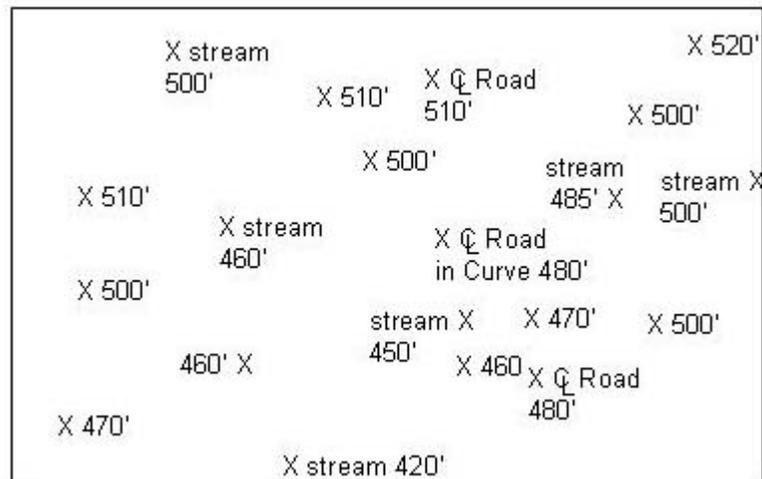**Engineering Graphics: In Class Work**

Contours

1. Use interpolation to determine elevation of point F. Assume distances are DF = 0.65" and FE = 0.8", measured on the map.	

2. Point A is 2.6" from Point B, measured on a map. The elevations are A = 343.8' & B = 369.2'. Estimate the distance between A & Point C. C lies along the line AB and has elevation = 360'. Assume a uniform slope.

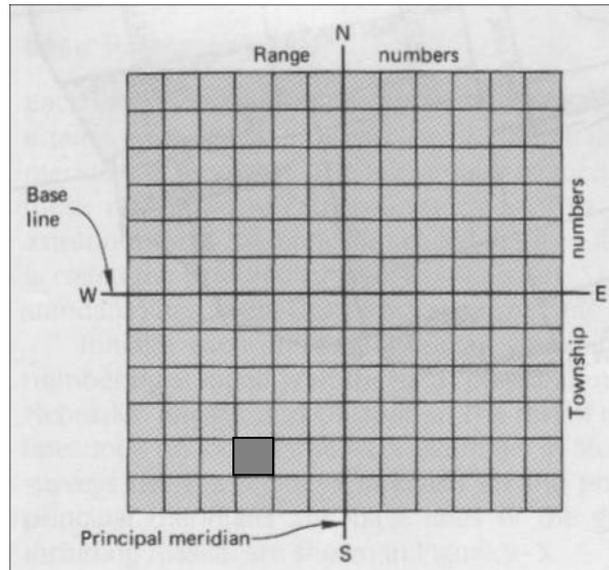|	
3. Use the Interpolation by Hand method to draw a contour map. Include the road and 2 streams. The streams join at the bottom of the map ("stream 420"). Use 10' intervals with 450 and 500 as index lines.	

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Profiles

A plan drawing has a scale of 1" = 500'. The associated profile is to have a horizontal scale exaggerated by 5 times. (a) what is the exaggerated scale? In order to make this work in AutoCAD, an elevation of 3' must be draw as how many feet?

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Rectangular System

1. (a) Identify shaded Township. (b) Shade Township that is T.5N, R.4W.	
2. The box to the right is a Section. (a & b) Record description of shaded plots. (c) Identify NW ¼ SW ¼ NE ¼ by shading. (d) Identify E ½ NW ¼ SE ¼ by shading.	