



## Determining the Map Paper Size of Custom Topographic Maps

To determine the Map Paper Size required to plot an Area of Interest at a desired Map Scale requires 1) measuring the maximum north-south extent of the Area of Interest, 2) measuring the maximum east-west extent of the Area of Interest, and 3) identifying the desired Map Scale, and 4) combining the information obtained in steps 1, 2, and 3. If a fractional scale is selected in step 3, it is necessary to convert it into a written scale for step 4. Each of the tasks is described using examples below.

### Map Scale Conversions

Examples of matching fractional and written map scales:

Fractional scale	Written scale, metric system	Written scale, imperial system
1:100,000	1 in represents 1.578 mi	1 cm represents 1 km
1:63,360	1 in represents 1 mi	1 cm represents 633.600 m
1:50,000	1 in represents 0.789 mi	1 cm represents 500 m
1:31,680	1 in represents 0.5 mi	1 cm represents 316.800 m
1:25,000	1 in represents 2,083.333 ft	1 cm represents 250 m
1:24,000	1 in represents 2,000 ft	1 cm represents 240 m
1:12,000	1 in represents 1,000 ft	1 cm represents 120 m
1:10,000	1 in represents 833.333 ft	1 cm represents 100 m
1:6,000	1 in represents 500 ft	1 cm represents 60 m
1:5,000	1 in represents 416.667 ft	1 cm represents 50 m

Example of conversion from fractional scale to metric written scale:

1:50,000

- 1 cm represents 50,000 cm (same units on both sides)
- 1 cm represents 500 m (divided by 100; 100 cm = 1 m)
- 1 cm represents 0.5 km (divided by 1,000; 1,000 m = 1 km)

Example of conversion from fractional scale to imperial written scale:

1:24,000

- 1 in represents 24,000 in (same units on both sides)
- 1 in represents 2,000 ft (divided by 12; 12 in = 1 ft)
- 1 in represents 0.379 mi (divided by 5,280; 5,280 ft = 1 mi)

Example of conversion from metric written scale to fractional scale:

1 cm represents 1 km

- 1 cm represents 1,000 m (multiplied by 1,000; 1 km = 1,000 m)
- 1 cm represents 100,000 cm (multiplied by 100; 1 m = 100 cm)
- 1:100,000 (same units on both sides)

Example of conversion from imperial written scale to fractional scale:

1 in represents 1 mi

→ 1 in represents 5,280 ft (multiplied by 5,280; 1 mi = 5,280 ft)

→ 1 in represents 63,360 in (multiplied by 12; 1 ft = 12 in)

→ 1:63,360 (same units on both sides)

### Examples for Calculating Map Paper Size

Example 1:

1. Determine the maximum north-south extent of the Area of Interest.

Example: 2.75 mi

2. Determine the maximum east-west extent of the Area of Interest.

Example: 3.75 mi

3. Determine the desired Map Scale:

Example: 1:24,000; 1 in represents 2,000 ft or 0.379 mi

4. Determine the Map Paper Size required to map the Area of Interest at the desired Map Scale:

Example:

0.379 mi are represented by 1 in → 2.75 mi are represented by about 7.26 in ( $2.75 / 0.379$ )

0.379 mi are represented by 1 in → 3.75 mi are represented by about 9.89 in ( $3.75 / 0.379$ )

The minimum paper size is about 8 in × 10 in.

Example 2:

1. Determine the maximum north-south extent of your Area of Interest.

Example: 2.75 mi

2. Determine the maximum east-west extent of your Area of Interest.

Example: 3.75 mi

3. Determine the desired Map Scale:

Example: 1:10,000; 1 in represents 833.333 ft or 0.158 mi

4. Determine the Map Paper Size required to map the Area of Interest at the desired Map Scale:

Example:

0.158 mi are represented by 1 in → 2.75 mi are represented by about 17.41 in ( $2.75 / 0.158$ )

0.158 mi are represented by 1 in → 3.75 mi are represented by about 23.73 in ( $3.75 / 0.158$ )

The minimum paper size is about 18 in × 24 in.