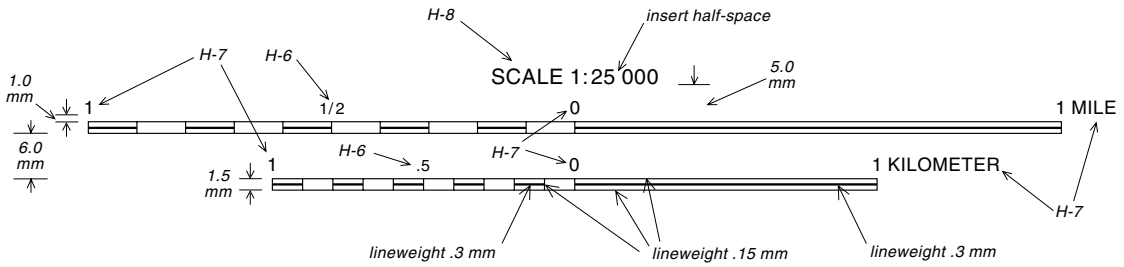
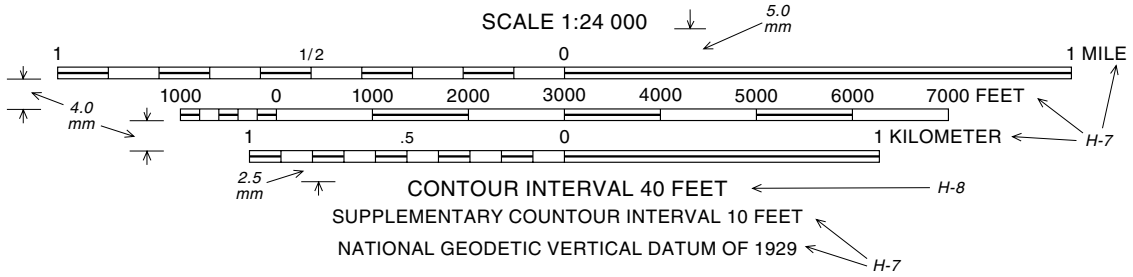
35—BAR SCALES

CARTOGRAPHIC SPECIFICATIONS

2 UNITS OF MEASUREMENT:



3 UNITS OF MEASUREMENT:



NOTES ON USAGE

Bar scales shown have been designed to use with a quadrangle-sized (1:24,000-scale) map. For other sizes and scales of maps, bar scales should be approximately one-third of the width of the map area, but usually not longer than 180 mm. See accompanying tables for various bar-scale calculations, as well as how to draw scales not shown.

DISTANCE MEASURES

1 mile (mi)	= 63,360 inches (in) = 5,280 feet (ft)
1 kilometer (km)	= 3,280.833 ft = 0.62137 mi

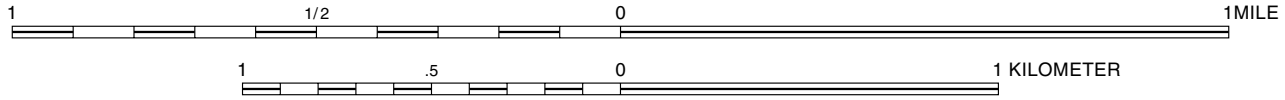
MEASUREMENT EQUIVALENTS

	Metric	English
1 millimeter (mm)	= 1/10 cm = 1/1000 m	= 0.039 in
1 centimeter (cm)	= 10 mm = 1/100 m	= 0.393 in
1 meter (m)	= 100 cm = 1,000 mm = 1/1,000 km	= 39.37 in or 3.28 ft or 0.00062 mi
1 kilometer (km)	= 1,000 m = 100,000 cm = 1,000,000 mm	= 3,280.833 ft or 0.62137 mi

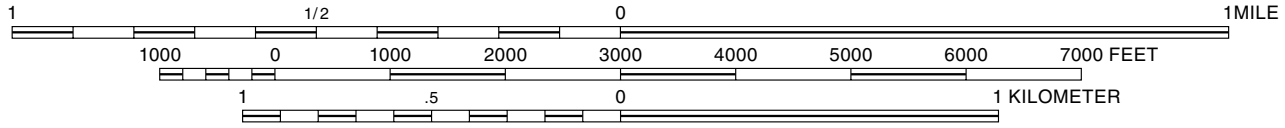
35—BAR SCALES (continued)

1:20 000, 1:24 000, 1:25 000, 1:31 250, 1:31 680

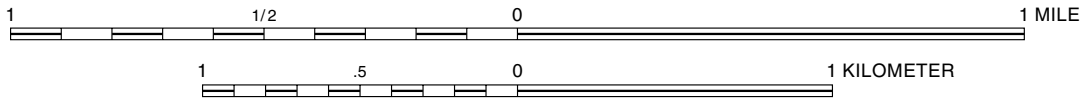
SCALE 1:20 000



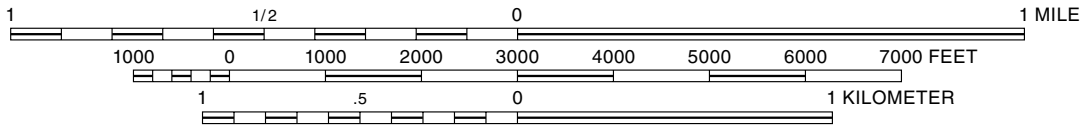
SCALE 1:20 000



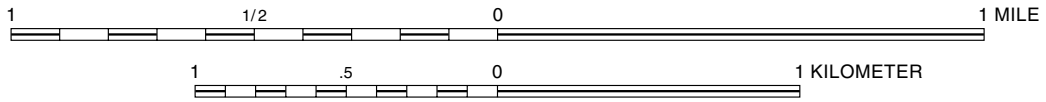
SCALE 1:24 000



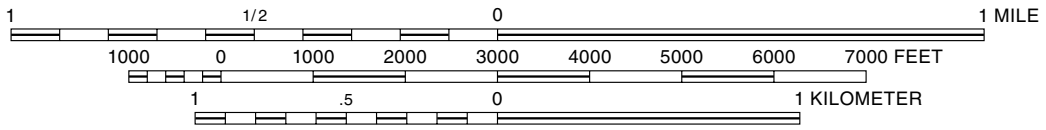
SCALE 1:24 000



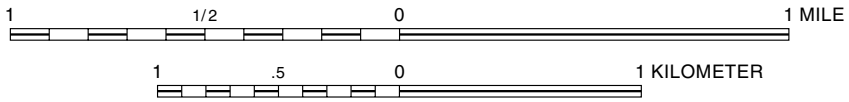
SCALE 1:25 000



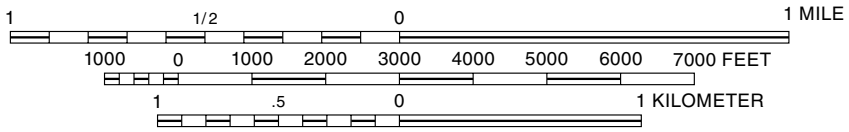
SCALE 1:25 000



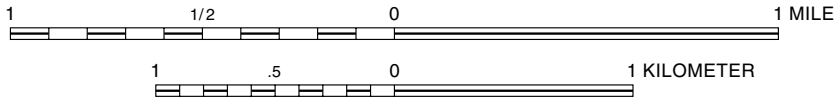
SCALE 1:31 250



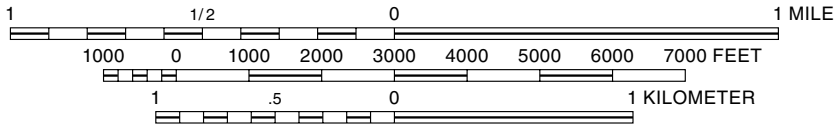
SCALE 1:31 250



SCALE 1:31 680



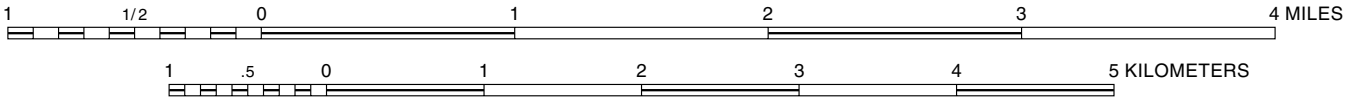
SCALE 1:31 680



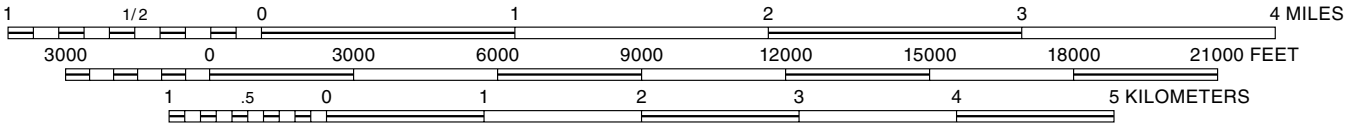
35—BAR SCALES (continued)

1:48 000, 1:50 000, 1:62 500, 1:63 360, 1:72 000

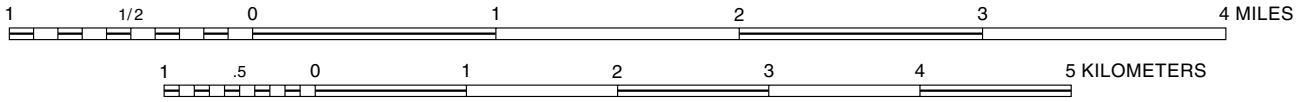
SCALE 1:48 000



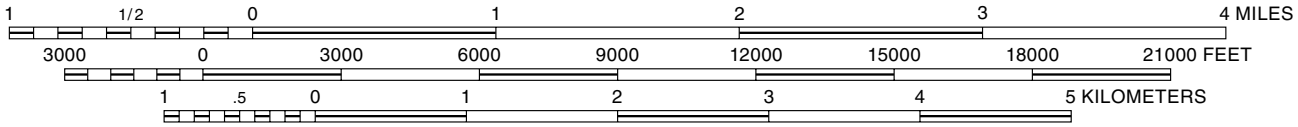
SCALE 1:48 000



SCALE 1:50 000

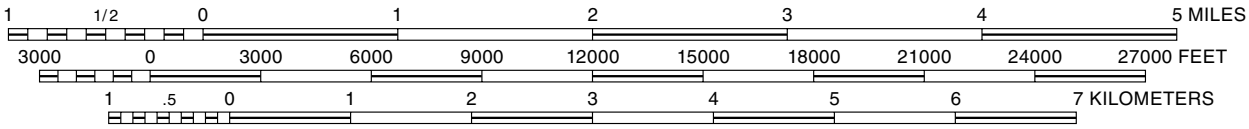


SCALE 1:50 000



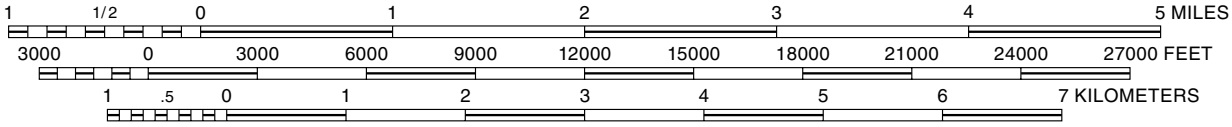
SCALE 1:62 500

SCALE 1:62 500



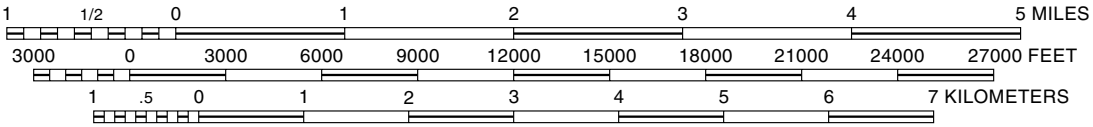
SCALE 1:63 360

SCALE 1:63 360



SCALE 1:72 000

SCALE 1:72 000



35—BAR SCALES (continued)

1:75 000, 1:96 000, 1:100 000, 1:125 000, 1:150 000, 1:250 000, 1:400 000, 1:500 000, 1:750 000

SCALE 1:75 000

1 1/2 0 1 2 3 4 5 MILES

1 .5 0 1 2 3 4 5 6 7 KILOMETERS

SCALE 1:75 000

1 1/2 0 1 2 3 4 5 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 24000 27000 FEET

1 .5 0 1 2 3 4 5 6 7 KILOMETERS

SCALE 1:96 000

1 0 1 2 3 4 5 6 MILES

1 0 1 2 3 4 5 6 7 8 KILOMETERS

SCALE 1:96 000

1 0 1 2 3 4 5 6 MILES

3000 0 3000 6000 9000 12000 15000 18000 21000 24000 27000 30000 FEET

1 0 1 2 3 4 5 6 7 8 KILOMETERS

SCALE 1:100 000

1 0 1 2 3 4 5 6 7 8 MILES

1 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS

SCALE 1:125 000

2 0 2 4 6 8 10 MILES

2 0 2 4 6 8 10 KILOMETERS

SCALE 1:150 000

2 0 2 4 6 8 10 MILES

2 0 2 4 6 8 10 KILOMETERS

SCALE 1:250 000

5 0 5 10 15 20 MILES

5 0 5 10 15 20 25 KILOMETERS

SCALE 1:400 000

10 0 10 20 30 MILES

10 0 10 20 30 40 50 KILOMETERS

SCALE 1:500 000

10 0 10 20 30 40 MILES

10 0 10 20 30 40 50 KILOMETERS

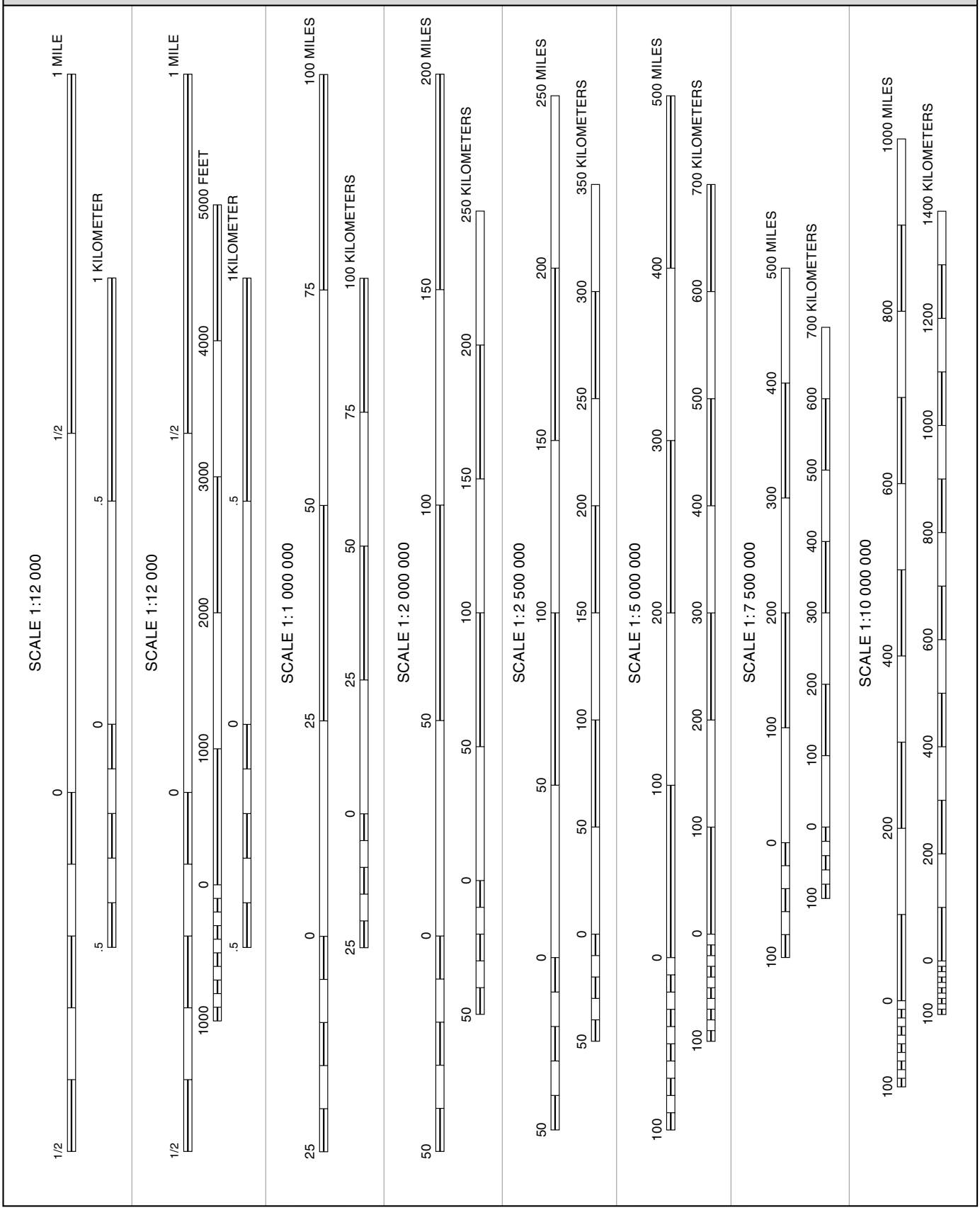
SCALE 1:750 000

10 0 10 20 30 40 50 MILES

10 0 10 20 30 40 50 KILOMETERS

35—BAR SCALES (continued)

1:12 000, 1:1 000 000, 1:2 000 000, 1:2 500 000, 1:5 000 000, 1:7 500 000, 1:10 000 000



35—BAR SCALES (continued)

BAR SCALE CALCULATIONS — MILES (1 mile = 63,360 inches)

FRACTIONAL SCALE	SCALE TO MAP REPRESENTATION: Scale Unit :	represents Map Unit	TO FIND MILES PER INCH (x in ratio) Use ratio below or $\frac{\text{SCALE}}{63\,360}$	MILES PER INCH	TOTAL MILES ON SCALE	TO FIND TOTAL SCALE LENGTH IN INCHES (y in ratio) Use ratio below or $\frac{\text{Miles on scale}}{\text{Miles per inch}}$	TOTAL SCALE LENGTH (INCHES)
1:12 000	1inch	12 000 in	$\frac{63\,360}{1} = \frac{12\,000}{\mathbf{x}}$	0.1893939	1.5	$\frac{0.1893939}{1} = \frac{1.5}{\mathbf{y}}$	7.920
1:20 000	1inch	20 000 in	$\frac{63\,360}{1} = \frac{20\,000}{\mathbf{x}}$	0.3156565	2	$\frac{0.3156565}{1} = \frac{2}{\mathbf{y}}$	6.336
1:24 000	1inch	24 000 in	$\frac{63\,360}{1} = \frac{24\,000}{\mathbf{x}}$	0.3787878	2	$\frac{0.3787878}{1} = \frac{2}{\mathbf{y}}$	5.280
1:25 000	1inch	25 000 in	$\frac{63\,360}{1} = \frac{25\,000}{\mathbf{x}}$	0.3945707	2	$\frac{0.3945707}{1} = \frac{2}{\mathbf{y}}$	5.068
1:31 250	1inch	31 250 in	$\frac{63\,360}{1} = \frac{31\,250}{\mathbf{x}}$	0.4932133	2	$\frac{0.4932133}{1} = \frac{2}{\mathbf{y}}$	4.055
1:31 680	1inch	31 680 in	$\frac{63\,360}{1} = \frac{31\,680}{\mathbf{x}}$	0.500	2	$\frac{0.500}{1} = \frac{2}{\mathbf{y}}$	4.000
1:48 000	1inch	48 000 in	$\frac{63\,360}{1} = \frac{48\,000}{\mathbf{x}}$	0.7575757	5	$\frac{0.7575757}{1} = \frac{5}{\mathbf{y}}$	6.600
1:50 000	1inch	50 000 in	$\frac{63\,360}{1} = \frac{50\,000}{\mathbf{x}}$	0.7891414	5	$\frac{0.7891414}{1} = \frac{5}{\mathbf{y}}$	6.336
1:62 500	1inch	62 500 in	$\frac{63\,360}{1} = \frac{62\,500}{\mathbf{x}}$	0.9864267	6	$\frac{0.9864267}{1} = \frac{6}{\mathbf{y}}$	6.082
1:63 360	1inch	63 360 in	$\frac{63\,360}{1} = \frac{63\,360}{\mathbf{x}}$	1.000	6	$\frac{1.000}{1} = \frac{6}{\mathbf{y}}$	6.000
1:72 000	1inch	72 000 in	$\frac{63\,360}{1} = \frac{72\,000}{\mathbf{x}}$	1.1363636	6	$\frac{1.1363636}{1} = \frac{6}{\mathbf{y}}$	5.280
1:75 000	1inch	75 000 in	$\frac{63\,360}{1} = \frac{75\,000}{\mathbf{x}}$	1.1837121	6	$\frac{1.1837121}{1} = \frac{6}{\mathbf{y}}$	5.068
1:96 000	1inch	96 000 in	$\frac{63\,360}{1} = \frac{96\,000}{\mathbf{x}}$	1.5151515	7	$\frac{1.5151515}{1} = \frac{7}{\mathbf{y}}$	4.620
1:100 000	1inch	100 000 in	$\frac{63\,360}{1} = \frac{100\,000}{\mathbf{x}}$	1.5782828	9	$\frac{1.5782828}{1} = \frac{9}{\mathbf{y}}$	5.702
1:125 000	1inch	125 000 in	$\frac{63\,360}{1} = \frac{125\,000}{\mathbf{x}}$	1.9728535	12	$\frac{1.9728535}{1} = \frac{12}{\mathbf{y}}$	6.082
1:150 000	1inch	150 000 in	$\frac{63\,360}{1} = \frac{150\,000}{\mathbf{x}}$	2.3674242	12	$\frac{2.3674242}{1} = \frac{12}{\mathbf{y}}$	5.068

To find miles per inch on 1: 12 000 map . . .

63,360 inches = 1 mile
Show in ratio as ...

$$\frac{63\,360}{1} \quad \begin{matrix}\textit{inches}\\ \textit{miles}\end{matrix}$$

Let SCALE (12 000) be in inches
Fractional scale says 1 inch represents 12,000 in
Let **x** be miles that 1 inch represents on map
Show in ratio as ...

$$\frac{12\,000}{\mathbf{x}} \quad \begin{matrix}\textit{inches}\\ \textit{miles}\end{matrix}$$

Solution . . .

$$\frac{63\,360}{1} = \frac{12\,000}{\mathbf{x}}$$

$$63\,360 \cdot \mathbf{x} = 12\,000 \cdot 1$$
$$63\,360\,\mathbf{x} = 12\,000$$
$$\frac{63\,360\,\mathbf{x}}{63\,360} = \frac{12\,000}{63\,360}$$
$$\mathbf{x} = \frac{12\,000}{63\,360}\ \text{(SCALE)}$$
$$\mathbf{x} = 0.1893939$$

35—BAR SCALES (continued)

BAR SCALE CALCULATIONS — MILES (1 mile = 63,360 inches)—continued

FRACTIONAL SCALE	SCALE TO MAP REPRESENTATION: Scale Unit :	represents Map Unit	TO FIND MILES PER INCH (**x** in ratio) Use ratio below or $\frac{\text{SCALE}}{63\,360}$	MILES PER INCH	TOTAL MILES ON SCALE	TO FIND TOTAL SCALE LENGTH IN INCHES (**y** in ratio) Use ratio below or $\frac{\text{Miles on scale}}{\text{Miles per inch}}$	TOTAL SCALE LENGTH (INCHES)
1:250 000	1inch	250 000 in	$\frac{63\,360}{1} = \frac{250\,000}{\mathbf{x}}$	3.945707	25	$\frac{3.945707}{1} = \frac{25}{\mathbf{y}}$	6.336
1:400 000	1inch	400 000 in	$\frac{63\,360}{1} = \frac{400\,000}{\mathbf{x}}$	6.3131313	40	$\frac{6.3131313}{1} = \frac{40}{\mathbf{y}}$	6.336
1:500 000	1inch	500 000 in	$\frac{63\,360}{1} = \frac{500\,000}{\mathbf{x}}$	7.8914141	50	$\frac{7.8914141}{1} = \frac{50}{\mathbf{y}}$	6.336
1:750 000	1inch	750 000 in	$\frac{63\,360}{1} = \frac{750\,000}{\mathbf{x}}$	11.837121	60	$\frac{11.837121}{1} = \frac{60}{\mathbf{y}}$	5.068
1:1 000 000	1inch	1 000 000 in	$\frac{63\,360}{1} = \frac{1\,000\,000}{\mathbf{x}}$	15.782828	125	$\frac{15.782828}{1} = \frac{125}{\mathbf{y}}$	7.920
1:2 000 000	1inch	2 000 000 in	$\frac{63\,360}{1} = \frac{2\,000\,000}{\mathbf{x}}$	31.565656	250	$\frac{31.565656}{1} = \frac{250}{\mathbf{y}}$	7.920
1:2 500 000	1inch	2 500 000 in	$\frac{63\,360}{1} = \frac{2\,500\,000}{\mathbf{x}}$	39.45707	300	$\frac{39.45707}{1} = \frac{300}{\mathbf{y}}$	7.603
1:5 000 000	1inch	5 000 000 in	$\frac{63\,360}{1} = \frac{5\,000\,000}{\mathbf{x}}$	78.914141	600	$\frac{78.914141}{1} = \frac{600}{\mathbf{y}}$	7.603
1:7 500 000	1inch	7 500 000 in	$\frac{63\,360}{1} = \frac{7\,500\,000}{\mathbf{x}}$	118.37121	600	$\frac{118.37121}{1} = \frac{600}{\mathbf{y}}$	5.068
1:10 000 000	1inch	10 000 000 in	$\frac{63\,360}{1} = \frac{10\,000\,000}{\mathbf{x}}$	157.82828	1100	$\frac{157.82828}{1} = \frac{1100}{\mathbf{y}}$	6.969

To find miles per inch on 1: 250 000 map . . .

63,360 inches = 1 mile
Show in ratio as ...

$$\frac{63\,360}{1} \quad \frac{\textit{inches}}{\textit{miles}}$$

Let SCALE (250 000) be in inches
Fractional scale says 1 inch represents 250,000 in
Let **x** be miles that 1 inch represents on map
Show in ratio as ...

$$\frac{250\,000}{\mathbf{x}} \quad \frac{\textit{inches}}{\textit{miles}}$$

Solution . . .

$$\frac{63\,360}{1} = \frac{250\,000}{\mathbf{x}}$$

$$63\,360 \cdot \mathbf{x} = 250\,000 \cdot 1$$

$$63\,360\,\mathbf{x} = 250\,000$$

$$\frac{63\,360\,\mathbf{x}}{63\,360} = \frac{250\,000}{63\,360}$$

$$\mathbf{x} = \frac{250\,000}{63\,360} \text{ (SCALE)}$$

$$\mathbf{x} = 3.945707$$

35—BAR SCALES (continued)

BAR SCALE CALCULATIONS — FEET (1 foot = 12 inches)

FRACTIONAL SCALE	SCALE TO MAP REPRESENTATION: Scale Unit :	SCALE TO MAP REPRESENTATION: represents Map Unit	TO FIND FEET PER INCH (**x** in ratio) Use ratio below or $\frac{\text{SCALE}}{12}$	FEET PER INCH	TOTAL FEET ON SCALE	TO FIND TOTAL SCALE LENGTH IN INCHES (**y** in ratio) Use ratio below or $\frac{\text{Feet on scale}}{\text{Feet per inch}}$	TOTAL SCALE LENGTH (INCHES)
1:12 000	1inch	12 000 in	$\frac{12}{1} = \frac{12\,000}{\mathbf{x}}$	1000.000	6000	$\frac{1000.000}{1} = \frac{6000}{\mathbf{y}}$	6.000
1:20 000	1inch	20 000 in	$\frac{12}{1} = \frac{20\,000}{\mathbf{x}}$	1666.6666	8000	$\frac{1666.6666}{1} = \frac{8000}{\mathbf{y}}$	4.800
1:24 000	1inch	24 000 in	$\frac{12}{1} = \frac{24\,000}{\mathbf{x}}$	2000.000	8000	$\frac{2000.000}{1} = \frac{8000}{\mathbf{y}}$	4.000
1:25 000	1inch	25 000 in	$\frac{12}{1} = \frac{25\,000}{\mathbf{x}}$	2083.3333	8000	$\frac{2083.3333}{1} = \frac{8000}{\mathbf{y}}$	3.840
1:31 250	1inch	31 250 in	$\frac{12}{1} = \frac{31\,250}{\mathbf{x}}$	2604.1666	8000	$\frac{2604.1666}{1} = \frac{8000}{\mathbf{y}}$	3.072
1:31 680	1inch	31 680 in	$\frac{12}{1} = \frac{31\,680}{\mathbf{x}}$	2640.000	8000	$\frac{2640.000}{1} = \frac{8000}{\mathbf{y}}$	3.030
1:48 000	1inch	48 000 in	$\frac{12}{1} = \frac{48\,000}{\mathbf{x}}$	4000.000	24 000	$\frac{4000.000}{1} = \frac{24\,000}{\mathbf{y}}$	6.000
1:50 000	1inch	50 000 in	$\frac{12}{1} = \frac{50\,000}{\mathbf{x}}$	4166.6666	24 000	$\frac{4166.6666}{1} = \frac{24\,000}{\mathbf{y}}$	5.760
1:62 500	1inch	62 500 in	$\frac{12}{1} = \frac{62\,500}{\mathbf{x}}$	5208.3333	30 000	$\frac{5208.3333}{1} = \frac{30\,000}{\mathbf{y}}$	5.760
1:63 360	1inch	63 360 in	$\frac{12}{1} = \frac{63\,360}{\mathbf{x}}$	5280.000	30 000	$\frac{5280.000}{1} = \frac{30\,000}{\mathbf{y}}$	5.681
1:72 000	1inch	72 000 in	$\frac{12}{1} = \frac{72\,000}{\mathbf{x}}$	6000.000	30 000	$\frac{6000.000}{1} = \frac{30\,000}{\mathbf{y}}$	5.000
1:75 000	1inch	75 000 in	$\frac{12}{1} = \frac{75\,000}{\mathbf{x}}$	6250.000	30 000	$\frac{6250.000}{1} = \frac{30\,000}{\mathbf{y}}$	4.800
1:96 000	1inch	96 000 in	$\frac{12}{1} = \frac{96\,000}{\mathbf{x}}$	8000.000	33 000	$\frac{8000.000}{1} = \frac{33\,000}{\mathbf{y}}$	4.125

To find feet per inch on 1: 12 000 map . . .

12 inches = 1 foot
Show in ratio as ...

$$\frac{12}{1} \quad \begin{matrix}\textit{inches}\\ \textit{feet}\end{matrix}$$

Let SCALE (12 000) be in inches
Fractional scale says 1 inch represents 12,000 inches
Let **x** be feet that 1 inch represents on map
Show in ratio as ...

$$\frac{12\,000}{\mathbf{x}} \quad \begin{matrix}\textit{inches}\\ \textit{feet}\end{matrix}$$

Solution . . .

$$\frac{12}{1} = \frac{12\,000}{\mathbf{x}}$$

$$12 \cdot \mathbf{x} = 12\,000 \cdot 1$$
$$12\,\mathbf{x} = 12\,000$$
$$\frac{12\,\mathbf{x}}{12} = \frac{12\,000}{12}$$
$$\mathbf{x} = \frac{12\,000}{12} \text{ (SCALE)}$$
$$\mathbf{x} = 1000.00$$

35—BAR SCALES (continued)

BAR SCALE CALCULATIONS — KILOMETERS (1 kilometer = 100,000 centimeters)

FRACTIONAL SCALE	SCALE TO MAP REPRESENTATION: Scale Unit :	SCALE TO MAP REPRESENTATION: represents Map Unit	TO FIND KILOMETERS PER CENTIMETER (CM) (**x** in ratio) Use ratio below or $\frac{\text{SCALE}}{100\,000}$	KILO-METERS PER CM	TOTAL KILOMETERS ON SCALE	TO FIND TOTAL SCALE LENGTH IN CENTIMETERS (**y** in ratio) Use ratio below or $\frac{\text{Kilometers on scale}}{\text{Kilometers per cm}}$	TOTAL SCALE LENGTH IN: CENTI-METERS	TOTAL SCALE LENGTH IN: MILLI-METERS
1:12 000	1cm	12 000 cm	$\frac{100\,000}{1} = \frac{12\,000}{\mathbf{x}}$	0.120	1.5	$\frac{0.120}{1} = \frac{1.5}{\mathbf{y}}$	12.500	125.00
1:20 000	1cm	20 000 cm	$\frac{100\,000}{1} = \frac{20\,000}{\mathbf{x}}$	0.200	2	$\frac{0.200}{1} = \frac{2}{\mathbf{y}}$	10.000	100.00
1:24 000	1cm	24 000 cm	$\frac{100\,000}{1} = \frac{24\,000}{\mathbf{x}}$	0.240	2	$\frac{0.240}{1} = \frac{2}{\mathbf{y}}$	8.333	83.33
1:25 000	1cm	25 000 cm	$\frac{100\,000}{1} = \frac{25\,000}{\mathbf{x}}$	0.250	2	$\frac{0.250}{1} = \frac{2}{\mathbf{y}}$	8.000	80.00
1:31 250	1cm	31 250 cm	$\frac{100\,000}{1} = \frac{31\,250}{\mathbf{x}}$	0.3125	2	$\frac{0.3125}{1} = \frac{2}{\mathbf{y}}$	6.400	64.00
1:31 680	1cm	31 680 cm	$\frac{100\,000}{1} = \frac{31\,680}{\mathbf{x}}$	0.3168	2	$\frac{0.3168}{1} = \frac{2}{\mathbf{y}}$	6.313	63.13
1:48 000	1cm	48 000 cm	$\frac{100\,000}{1} = \frac{48\,000}{\mathbf{x}}$	0.480	6	$\frac{0.480}{1} = \frac{6}{\mathbf{y}}$	12.500	125.00
1:50 000	1cm	50 000 cm	$\frac{100\,000}{1} = \frac{50\,000}{\mathbf{x}}$	0.500	6	$\frac{0.500}{1} = \frac{6}{\mathbf{y}}$	12.000	120.00
1:62 500	1cm	62 500 cm	$\frac{100\,000}{1} = \frac{62\,500}{\mathbf{x}}$	0.625	8	$\frac{0.625}{1} = \frac{8}{\mathbf{y}}$	12.800	128.00
1:63 360	1cm	63 360 cm	$\frac{100\,000}{1} = \frac{63\,360}{\mathbf{x}}$	0.6336	8	$\frac{0.6336}{1} = \frac{8}{\mathbf{y}}$	12.626	126.26
1:72 000	1cm	72 000 cm	$\frac{100\,000}{1} = \frac{72\,000}{\mathbf{x}}$	0.720	8	$\frac{0.720}{1} = \frac{8}{\mathbf{y}}$	11.111	111.11
1:75 000	1cm	75 000 cm	$\frac{100\,000}{1} = \frac{75\,000}{\mathbf{x}}$	0.750	8	$\frac{0.750}{1} = \frac{8}{\mathbf{y}}$	10.666	106.66
1:96 000	1cm	96 000 cm	$\frac{100\,000}{1} = \frac{96\,000}{\mathbf{x}}$	0.960	9	$\frac{0.960}{1} = \frac{9}{\mathbf{y}}$	9.375	93.75
1:100 000	1cm	100 000 cm	$\frac{100\,000}{1} = \frac{100\,000}{\mathbf{x}}$	1.000	11	$\frac{1.000}{1} = \frac{11}{\mathbf{y}}$	11.000	110.00
1:125 000	1cm	125 000 cm	$\frac{100\,000}{1} = \frac{125\,000}{\mathbf{x}}$	1.250	12	$\frac{1.250}{1} = \frac{12}{\mathbf{y}}$	9.600	96.00
1:150 000	1cm	150 000 cm	$\frac{100\,000}{1} = \frac{150\,000}{\mathbf{x}}$	1.500	12	$\frac{1.500}{1} = \frac{12}{\mathbf{y}}$	8.000	80.00

To find kilometers per centimeter on 1: 12 000 map . . .

100 000 centimeters = 1 kilometer
Show in ratio as ...

$$\frac{100\,000}{1} \quad \begin{matrix}\textit{centimeters}\\ \textit{kilometers}\end{matrix}$$

Let SCALE (12 000) be in centimeters
Fractional scale says 1 centimeter represents 12,000 centimeters
Let **x** be kilometers that 1 cm represents on map
Show in ratio as ...

$$\frac{12\,000}{\mathbf{x}} \quad \begin{matrix}\textit{centimeters}\\ \textit{kilometers}\end{matrix}$$

Solution . . .

$$\frac{100\,000}{1} = \frac{12\,000}{\mathbf{x}}$$

$$100\,000 \cdot \mathbf{x} = 12\,000 \cdot 1$$

$$100\,000\,\mathbf{x} = 12\,000$$

$$\frac{100\,000\,\mathbf{x}}{100\,000} = \frac{12\,000}{100\,000}$$

$$\mathbf{x} = \frac{12\,000\ (\text{SCALE})}{100\,000}$$

$$\mathbf{x} = 0.120$$

35—BAR SCALES (continued)

BAR SCALE CALCULATIONS — KILOMETERS (1 kilometer = 100,000 centimeters)—continued

FRACTIONAL SCALE	SCALE TO MAP REPRESENTATION: Scale Unit	: represents Map Unit	TO FIND KILOMETERS PER CENTIMETER (CM) (**x** in ratio) Use ratio below or $\frac{\text{SCALE}}{100\,000}$	KILO-METERS PER CM	TOTAL KILOMETERS ON SCALE	TO FIND TOTAL SCALE LENGTH IN CENTIMETERS (**y** in ratio) Use ratio below or $\frac{\text{Kilometers on scale}}{\text{Kilometers per cm}}$	TOTAL SCALE LENGTH IN: CENTI-METERS	MILLI-METERS
1:250 000	1cm	250 000 cm	$\frac{100\,000}{1} = \frac{250\,000}{\mathbf{x}}$	2.500	30	$\frac{2.500}{1} = \frac{30}{\mathbf{y}}$	12.000	120.00
1:400 000	1cm	400 000 cm	$\frac{100\,000}{1} = \frac{400\,000}{\mathbf{x}}$	4.000	60	$\frac{4.000}{1} = \frac{60}{\mathbf{y}}$	15.000	150.00
1:500 000	1cm	500 000 cm	$\frac{100\,000}{1} = \frac{500\,000}{\mathbf{x}}$	5.000	60	$\frac{5.000}{1} = \frac{60}{\mathbf{y}}$	12.000	120.00
1:750 000	1cm	750 000 cm	$\frac{100\,000}{1} = \frac{750\,000}{\mathbf{x}}$	7.500	60	$\frac{7.500}{1} = \frac{60}{\mathbf{y}}$	8.000	80.00
1:1 000 000	1cm	1 000 000 cm	$\frac{100\,000}{1} = \frac{1\,000\,000}{\mathbf{x}}$	10.000	125	$\frac{10.000}{1} = \frac{125}{\mathbf{y}}$	12.500	125.00
1:2 000 000	1cm	2 000 000 cm	$\frac{100\,000}{1} = \frac{2\,000\,000}{\mathbf{x}}$	20.000	300	$\frac{20.000}{1} = \frac{300}{\mathbf{y}}$	15.000	150.00
1:2 500 000	1cm	2 500 000 cm	$\frac{100\,000}{1} = \frac{2\,500\,000}{\mathbf{x}}$	25.000	400	$\frac{25.000}{1} = \frac{400}{\mathbf{y}}$	16.000	160.00
1:5 000 000	1cm	5 000 000 cm	$\frac{100\,000}{1} = \frac{5\,000\,000}{\mathbf{x}}$	50.000	800	$\frac{50.000}{1} = \frac{800}{\mathbf{y}}$	16.000	160.00
1:7 500 000	1cm	7 500 000 cm	$\frac{100\,000}{1} = \frac{7\,500\,000}{\mathbf{x}}$	75.000	800	$\frac{75.000}{1} = \frac{800}{\mathbf{y}}$	10.666	106.66
1:10 000 000	1cm	10 000 000 cm	$\frac{100\,000}{1} = \frac{10\,000\,000}{\mathbf{x}}$	100.000	1500	$\frac{100.000}{1} = \frac{1500}{\mathbf{y}}$	15.000	150.00

To find kilometers per centimeter on 1: 250 000 map . . .

100 000 centimeters = 1 kilometer
Show in ratio as ...

$$\frac{100\,000}{1} \quad \begin{matrix}\textit{centimeters}\\ \textit{kilometers}\end{matrix}$$

Let SCALE (250 000) be in centimeters
Fractional scale says 1 centimeter represents 250,000 centimeters
Let **x** be kilometers that 1 cm represents on map
Show in ratio as ...

$$\frac{250\,000}{\mathbf{x}} \quad \begin{matrix}\textit{centimeters}\\ \textit{kilometers}\end{matrix}$$

Solution . . .

$$\frac{100\,000}{1} = \frac{250\,000}{\mathbf{x}}$$

$$100\,000 \cdot \mathbf{x} = 250\,000 \cdot 1$$

$$100\,000\,\mathbf{x} = 250\,000$$

$$\frac{100\,000\,\mathbf{x}}{100\,000} = \frac{250\,000}{100\,000}$$

$$\mathbf{x} = \frac{250\,000}{100\,000} \text{ (SCALE)}$$

$$\mathbf{x} = 2.5$$