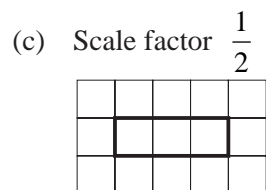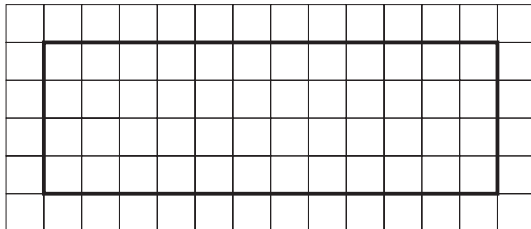Practice Book   *UNIT 19   Similarity*   Answers
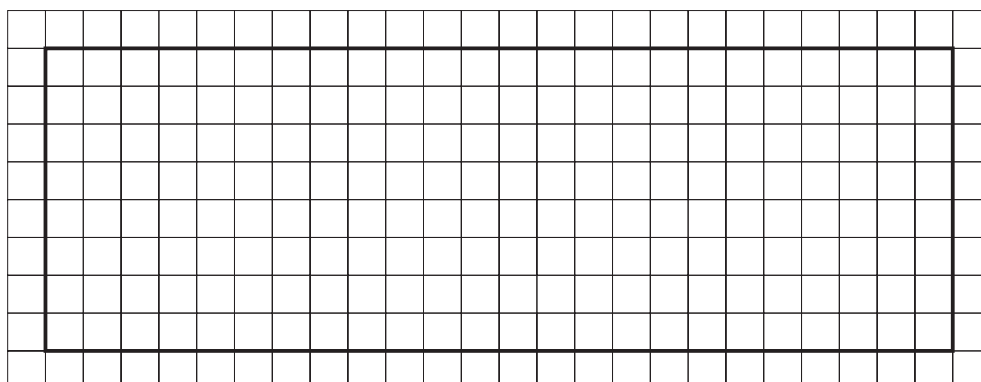
19.1 Enlargement

1. B Scale factor 2

    E Scale factor 3

2. B, E

3. B Scale factor 2

    C Scale factor 3

    D Scale factor $\frac{1}{2}$ or 0.5

    E Scale factor $1\frac{1}{2}$ or 1.5

4. C, E

5. B, E

6. C, E
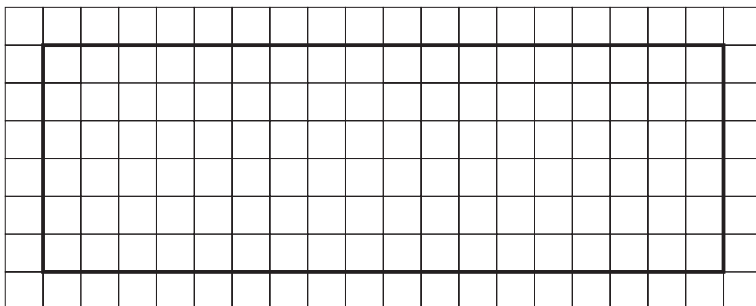
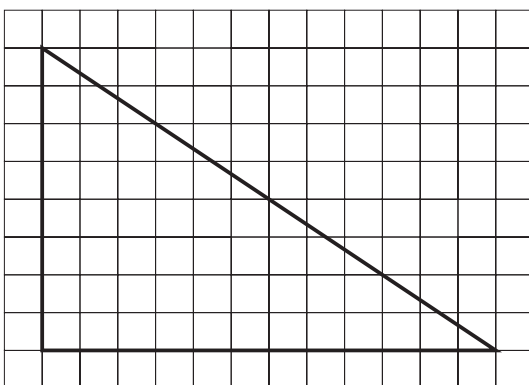7. (a) Scale factor 2   (c) Scale factor $\frac{1}{2}$

    (b) Scale factor 4

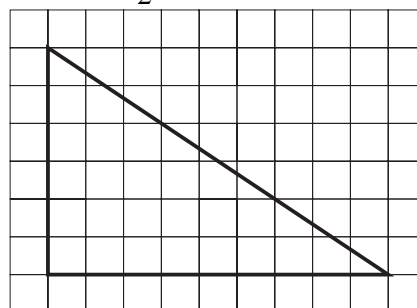## 19.1

Answers

(d) Scale factor 3

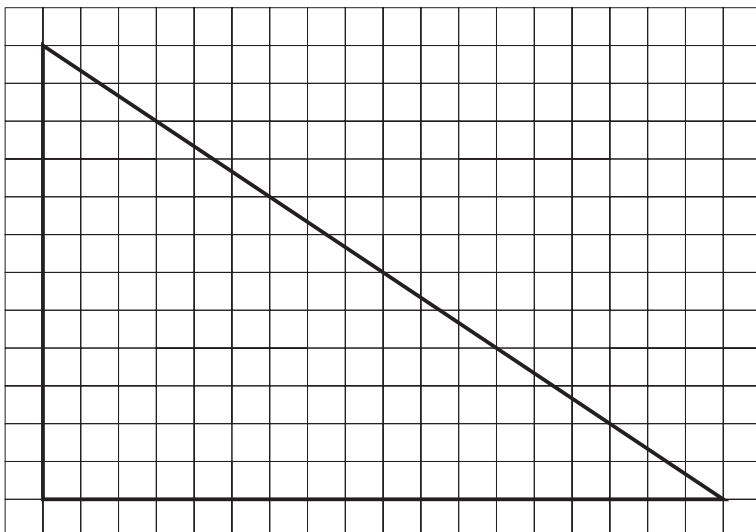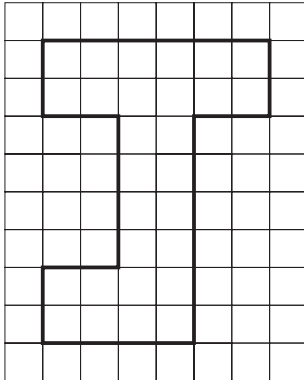8. (a) Scale factor 2

(c) Scale factor $1\frac{1}{2}$

(b) Scale factor 3

19.1   Answers

9.

10.
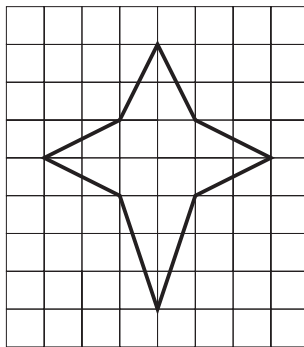
19.2 Similar Shapes

1.   Scale factor $= \dfrac{30}{6} = 5$ C D $= 5 \times 16 = 80$ cm

2.   Scale factor $= \dfrac{12}{6} = 2$ (a)   A B $= 2 \times 2.5 = 5$ cm   (b)   E F $= \dfrac{13}{2} = 6.5$ cm

3.   Scale factor $= 8$ (a)   D E $= \dfrac{32}{8} = 4$ cm   (b)   A C $= 4 \times 8 = 32$ cm

(c)   B C $= 3 \times 8 = 24$ cm

4.   Scale factor $= 7$ G E $= 42$ cm

F G $= 35$ cm

5.   Scale factor $= 2,\ 6$ (a)   E G $= 10$ cm   (b)   H J $= 30$ cm

(c)   E F $= 12$ cm   (d)   A B $= 6$ cm

6.   Scale factors $= 1\dfrac{1}{2},\ 2\dfrac{1}{2}$ (a)   H I $= 7.5$ cm   (b)   B C $= 3$ cm

(c)   A C $= 5$ cm   (e)   D F $= 7.5$ cm

7.   (a)   I P $= 8$ cm   (b)   J K $= 2$ cm   (c)   L M $= 2$ cm

(d)   F G $= 6$ cm   N O $= 4$ cm   (e)   E F $= 4.5$ cm

19.2   Answers

8. (a) (i) Angle A B E = angle D B C   (ii) Angle B A E = angle B D C

    (iii) Angle A E B = angle B C D

    (b) A B = 16.4 cm; B E = 20 cm

9. (a) Since BE is parallel to D D, angle A E B = angel A D C and angle A B E = angle A C D.
        Also, angle A is common to both triangles. So triangle A B E is similar to triangle A C D.

    (b) A C = 6.6 cm ,   B C = 2.2 cm

    (c) A E = 9.0 cm,   D E = 4.5 cm

10. Scale factor 0.6   (a) A C = $0.6 \times 15 = 9$ cm; C D = $\dfrac{8}{10} \times 15 = 12$ cm; D E = 3 cm

                            (b) C F = $\dfrac{10.8}{0.6} = 18$ cm; G C = $0.8 \times 18 = 14.4$ cm; F G = 3.6 cm

19.3 Line, Area and Volume Ratios

1. (a) 12 cm^2, 192 cm^2 (b) 4   (c) $4^2 = 16$

2. (a) 48 cm^2 (b) 108 cm^2 (c) 432 cm^2 (d) 1200 cm^2

3.

Length of Sides Base	Height	Scale Factor	Area	Area Factor
3 cm	4 cm	1	6 cm^2	1
6 cm	8 cm	2	24 cm^2	4
9 cm	12 cm	3	54 cm^2	9
12 cm	16 cm	4	96 cm^2	16
15 cm	20 cm	5	150 cm^2	25
18 cm	24 cm	6	216 cm^2	36
30 cm	40 cm	10	600 cm^2	100
4.5 cm	6 cm	1.5	13.5 cm^2	2.25

4. Area = $25 \times 42 = 1050$ cm^2

5. Area = $9 \times 50 = 450$ cm^2

19.3   Answers

6.   Large rectangle has sides $4 \times$ small rectangle.

7.   (a)   Smaller $= 24$ cm^3 ;   Larger $= 192$ cm^3

     (b)   Scale factor $= 2$

     (c)   8

     (d) $2^3 = 8$

8.

Dimensions			Scale Factor	Volume	Volume Factor
Width	Length	Height			
3 cm	6 cm	2 cm	1	36 cm^3	1
6 cm	12 cm	4 cm	2	288 cm^3	8
12 cm	24 cm	8 cm	4	2304 cm^3	64
15 cm	30 cm	10 cm	5	4500 cm^3	125
30 cm	60 cm	20 cm	10	36 000 cm^3	1000

9.   Vol $= 27 \times 32 = 864$ cm^3

10. Vol $= (2.5)^3 \times 42 = 656.25$ cm^3

19.4 Maps and Scale Models

1.   (a) 400 cm $= 4$ m   (b) $50\,000$ cm$^2 = 5$ m^2 (c) 3.2 m^3 ($3\,200\,000$ cm^3)

2.   (a) $50 \times 50\,000^2 = 125\,000\,000\,000$ cm^2 (b) $12\,500\,000$ m^2 (c) 12.5 km^2

3. 7776 m^3

4.   (a) $16\,000\,000\,000$ cm^2 (b) $1\,600\,000$ m^2 (c) 1.6 km^2

5.   (a) 6 m   (b) 76.5 m^2 (c) 3898.8 m^3

6.   (a) $1 : 20$ (b) 24.12 m^3 (c) 800 cm^2 or 0.08 m^2

7. 16 km^2

8. 312.5 cm^2

9.   (a) 5000 (b) 600 cm^2 (c) 7500 cm^3

10. $1 : 50\,000$

5