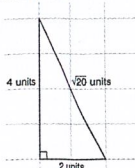


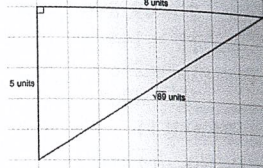
15.  $15^2 = 12^2 + 9^2$ ; Length of legs: 12 cm and 9 cm  
 16. 3.535 cm<sup>2</sup>, 6.283 cm<sup>2</sup>, 9.817 cm<sup>2</sup>

The sum of the areas of the semicircles on the legs is equal to the area of the semicircle on the hypotenuse.

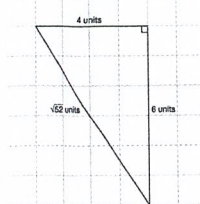
17.a)



b)



c)



- 18.a)  $\sqrt{2}$  cm,  $\sqrt{3}$  cm,  $\sqrt{4}$  cm,  $\sqrt{5}$  cm,  $\sqrt{6}$  cm,  $\sqrt{7}$  cm  
 b) 1.4, 1.7, 2.0, 2.2, 2.4, 2.6  
 c) 1.4 cm, 1.7 cm, 2.0 cm, 2.2 cm, 2.4 cm, 2.6 cm  
 d) The lengths of the hypotenuses are the square roots of consecutive whole numbers.

### 1.6 Exploring the Pythagorean Theorem, page 43

- 3.a) Yes;  $38 + 25 = 63$     b) No;  $38 + 25 \neq 60$   
 4.a) No;  $10^2 + 1^2 \neq 13^2$     b) No;  $7^2 + 5^2 \neq 8^2$   
 c) Yes;  $15^2 + 8^2 = 17^2$   
 5. No, since it is not a right triangle  
 6.a) Yes    b) No    c) Yes    d) Yes  
 e) No    f) No    g) No    h) Yes  
 7. a, c, d, f  
 8. Yes, it is a right angle since  $9^2 + 12^2 = 15^2$ .  
 9. Yes, the triangle is a right triangle;

$$7^2 = 6^2 + (\sqrt{13})^2$$

No, the side lengths do not form a Pythagorean triple since  $\sqrt{13}$  is not a whole number.

10.  $3^2 + 5^2 \neq 7^2$ ; Not a right triangle  
 11.a) Legs: 3, 4; 6, 8; 9, 12; 12, 16; 15, 20  
 Hypotenuse: 5; 10; 15; 20; 25  
 b) All triples are multiples of first triple 3, 4, 5.  
 c) 10, 24, 26; 15, 36, 39; 20, 48, 52; 25, 60, 65  
 12.a) 50, since  $14^2 + 48^2 = 50^2$

- b) 40, since  $32^2 + 24^2 = 40^2$   
 c) 35, since  $12^2 + 35^2 = 37^2$   
 d) 99, since  $20^2 + 99^2 = 101^2$   
 13. Hold the 1st, 4th, and 8th knots to form a right triangle with side lengths 3 units, 4 units, and 5 units.

14. Yes; Since  $48^2 + 55^2 = 73^2$ ; all angles are right angles.

15. 40 m and 9 m, since  $9^2 + 40^2 = 41^2$

16.a) For obtuse triangles, the area of the square on the longest side is greater than the sum of the areas of the squares on the two smaller sides.

b) For acute triangles, the area of the square on the largest side is less than the sum of the areas of the squares on the two smaller sides.

c) In question 6,

- the acute triangle is: b
- the right triangles are: a, c, d, h
- the obtuse triangles are: e, f, g

17. Answers will vary. For example:

Lesser number: 8; Greater number: 14  
 Triple: 224, 132, 260

### 1.7 Applying the Pythagorean Theorem, page 49

- 4.a) 29 cm    b) 12.2 cm    c) 15.8 cm  
 5.a) 24 cm    b) 15 cm    c) 5.7 cm  
 6. 4 m  
 7.a) 26 cm or 21.8 cm  
 b) The unknown side could be a leg or the hypotenuse of the right triangle.  
 8.a) 6.7 units    b) 7.8 units  
 9. 65 cm  
 10. 91 m  
 11. 38.18 m  
 12.a) The area of the square on the hypotenuse is equal to the sum of the areas of the squares on the legs.  
 b) The square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

13. 57.4 cm

14. F; I drew two right triangles with hypotenuses AB and AF. The legs of both triangles were 4 units and 3 units.

15. 5.8 units    16. 216.9 m

17. Yes;  $650^2 + 720^2 = 970^2$

18. 403.1 km    19. 7.6 cm    20. 17 cm

21. 37.3 m    22. 291.2 km

### Unit 1 Unit Review, page 54

1. Rectangles: 1 unit by 24 units, 2 units by 12 units, 3 units by 8 units, 4 units by 6 units  
 Not a perfect square since 24 cannot be modelled by a square

2. 25

3. Answers may vary  
 1600, 2401, 2500

4.a) 25    b) 49

5.a) 7    b) 17

6.a) i) 1, 2, 3, 4, 6

ii) 1, 19, 361

iii) 1, 2, 3, 5, 10

iv) 1, 2, 11, 121

v) 1, 2, 3, 4, 16, 324

vi) 1, 2, 4, 7, 28

b) 361 and 324; factors.

7. 44 cm

8.  $A = 17$  square units

9.a)  $\sqrt{75}$  cm

10. b; I drew a square and found the area

11.a) 26    b) 10

12.a) 6 and 7    c) 10 and 11

13.a) 2    b) 3

14.a) 7.4    b) 8.5

15. 8.49, since  $8^2 = 64$

16. 130 cm

17.a) False

18.a) 34 cm

19.a) 8.5 cm

20. Yes, since  $2^2 + 1^2 = 5^2$

21. No;  $7^2 + 12^2 \neq 13^2$

22. a and c

23. 21; One solution

all three numbers

24. 40 km

25. 42 cm

26. The distance between the two possible positions of the hypotenuse is 2 units

27. 31.2 km

### Unit 1 Prac page 58

1.a) 11

2.  $\sqrt{1} = \sqrt{1}$

3.  $s = 8$  cm

4.a) 25 square units

5.a) Yes; 1

6.a) 14.2 cm

7.a) No; 2

8.a) 16.2 cm

9.a) 3.6 cm