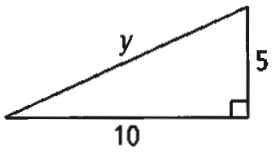
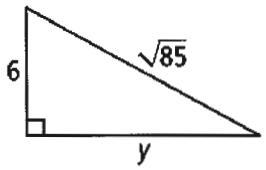
Name Answers Date

8.2 & 8.3 – The Pythagorean Theorem and Its Converse

Find the value of x or y. Express in simplest radical form. Show work.

1) 

$5\sqrt{5}$

2) 

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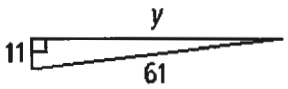
3) 

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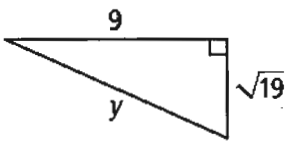
4) 

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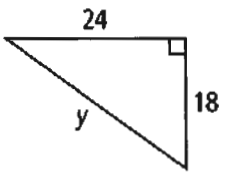
5) 

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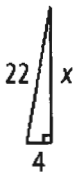
6) 

$6\sqrt{13}$

The lengths of the sides of a triangle are given. Classify each triangle as *acute*, *right*, or *obtuse*.

7) 3, 8, 10

obtuse

8) 4, 5, 7

obtuse

9) 12, 15, 19

acute

10) 10, 24, 26

right

11) 20, 21, 28

acute

12) 20, 48, 52

right

13) A square has side length 10 yd. What is the length of a diagonal of the square? Express in simplest radical form.

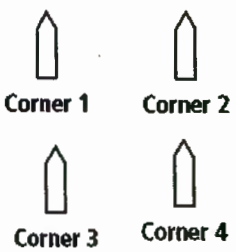
$10\sqrt{2}$

14) A square has diagonal length 9 m. What is the side length of the square, to the nearest centimeter?

15) A repairman leans the top of an 8-ft ladder against the top of a stone wall. The base of the ladder is 5.5 ft from the wall. About how tall is the wall? Round to the nearest tenth of a foot.

≈ 5.8 ft

16) When field archeologists plan an excavation, or digging site, they place a rectangular grid over the surface to be dug up. An archeologist decides that the dimensions of such a grid will be 11 m by 15 m. She will place stakes at the corners of the grid. How can she make sure that she places the stakes in the correct location? Explain.



She can use the pythagorean theorem to determine the distance between the corner stakes as the diagonal of a rectangle. The distance between corner 1 and 4 should be approximately 18.6 m.

17) A river runs straight through the center of a park. A man stands on one bank of the river, and his daughter stands across the river and 22 ft upstream. The man's son swims from the man to his daughter. If the river is 11 ft wide, how far does the son swim? Round to the nearest foot.

≈ 25 ft.

For each pair of numbers, find a third whole number such that the three numbers form a Pythagorean triple.

18) 32, 60

68

19) 16, 12

20

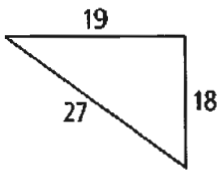
20) 32, 60

68

Oops!!

Is each triangle a right triangle? Explain.

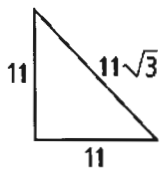
21)



No.

$19^2 + 18^2 \neq 27^2$

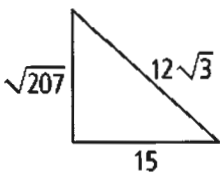
22)



No.

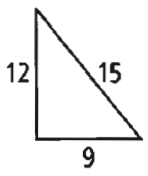
$11^2 + 11^2 \neq (11\sqrt{3})^2$

23)



Yes. $(\sqrt{207})^2 + 15^2 = (12\sqrt{3})^2$

24)



Yes.

$9^2 + 12^2 = 15^2$

25) A square is drawn inside a circle so that its vertices touch the circle. If the radius of the circle is 15 cm, what is the perimeter of the square?

$60\sqrt{2}$ cm

26) The playing surface of a football field is 300 ft long and 160 ft wide. If a player runs from one corner of the field to the opposite corner, how many feet does he run?

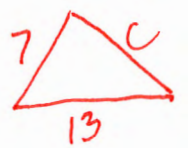
340 ft.

27) ΔEFG is an obtuse triangle. Two of its sides measure 13 cm and 7 cm. What is the range of possible values for its third side to the nearest tenth of a centimeter?

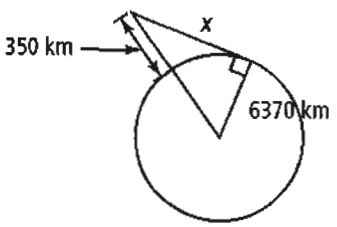
$14.8 \text{ cm} < x < 20 \text{cm}$

or

$6 \text{ cm} < x < 11 \text{cm}$



28) The International Space Station orbits 350 km above Earth's surface. Earth's radius is about 6370 km. Use the Pythagorean Theorem to find the distance from the space station to Earth's horizon. Round your answer to the nearest 10 kilometers. (Diagram is not to scale.)



≈ 2140 km.