Advanced Geometry   Name: **Key**

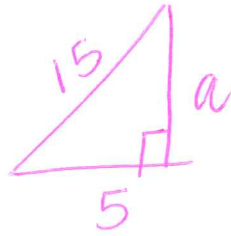Chapter 10 Review   **#1, 4, 5**   Date: _____ Period: _____

Identify the choice that best completes the statement or answers the question.

1.) A 15 foot ladder is leaning against a shed. The base of the ladder is 5 feet from the shed. About how high up the shed does the ladder reach?
a. 14 ft.
b. 10 ft.
c. 20 ft.
d. 160 ft.

$a^2 + 5^2 = 15^2$

$a^2 + 25 = 225$

$\sqrt{a^2} = \sqrt{200}$ $a \approx 14.14$

2.) A sidewalk forms the diagonal of a square park. The sidewalk is 30 meters long. To the nearest tenth of a meter, how long are sides of the park?
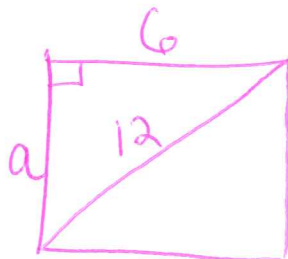a. 15.0 m
b. 28.5 m
c. 75.0 m
d. 21.2 m

3.) A support wire is needed to stabilize a 24 foot pole. If the wire is to be anchored to the ground 10 ft from the base of the pole, how long will the wire have to be?
a. 34 ft.
b. 26 ft.
c. 14 ft.
d. 146 ft.

4.) The length of a rectangle is 6 cm. The length of a diagonal of the rectangle is 12 cm. Find the exact width of the rectangle.
a. $6\sqrt{3}$ cm
b. $6\sqrt{5}$ cm
c. $6\sqrt{2}$ cm
d. 6 cm

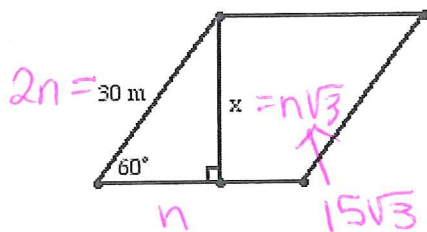$a^2 + 6^2 = 12^2$ $a = \sqrt{108}$

$a^2 + 36 = 144$

$\sqrt{a^2} = \sqrt{108}$

$a = 2 \cdot 3\sqrt{3}$

$a = 6\sqrt{3}$

5.) A rhombus has 30 m sides. If the angle at one corner is 60^0, find exact the height of the rhombus.
a. $15\sqrt{3}$ m
b. $30\sqrt{3}$ m
c. 15 m
d. 30 m

$2n = 30$ m $x = n\sqrt{3}$
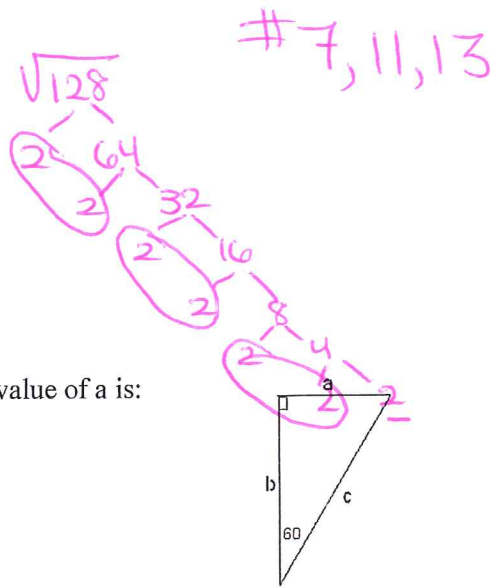
$\dfrac{2n}{2} = \dfrac{30}{2}$

$n = 15$

$15\sqrt{3}$

6.) Simplify $\sqrt{64}$
a. $6\sqrt{3}$
b. 8
c. 12
d. $6\sqrt{2}$

#7,11,13

7.) Simplify $\sqrt{128}$
a. $6\sqrt{2}$
b. $6\sqrt{6}$
c. $4\sqrt{2}$
d. $8\sqrt{2}$

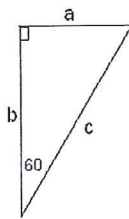*(handwritten work: $\sqrt{128}$, factor tree 2·64, 2·32, 2·16, 2·8, 2·4, 2·2; $2·2·2\sqrt{2} = 8\sqrt{2}$)*

8.) If $a = 5$, then the exact value of a is:
a. $5\sqrt{3}$
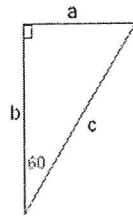b. $\dfrac{5\sqrt{2}}{2}$
c. $\dfrac{5\sqrt{3}}{3}$
d. 5

(diagram: right triangle with sides a, b, c and 60° angle)
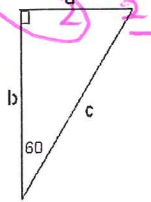
9.) If $a = 2\sqrt{3}$, then the exact value of b is:

a. 2
b. 6
c. $4\sqrt{3}$
d. $4\sqrt{2}$

(diagram: right triangle with sides a, b, c and 60° angle)

10.) If b=7, then the exact value of c is:

a. 7

b. 3.5

c. $7\sqrt{3}$

d. 14

(diagram: right triangle with sides a, b, c and 60° angle)

11.) If $b = 7$, then the exact value of a is:
a. 7

b. $7\sqrt{2}$

c. $7\sqrt{3}$

d. 14

(handwritten: $n\sqrt{3} = a$, $7\sqrt{3}$, $c = 2n$, $b = n$, $b = 7$, $b = n$, $b = 7$ or $n = 7$; triangle with 30° angle)
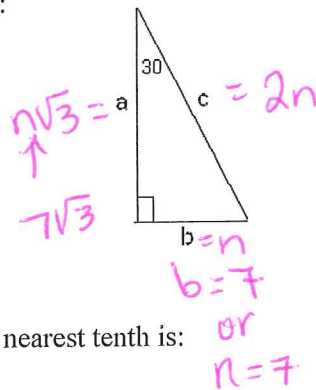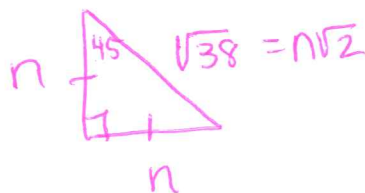
12.) If $a = 12$, then the value of b, to the nearest tenth is:
a. 6.0
b. 4.2
c. 4.0
d. 3.5

13.) What is the length of each leg of an isosceles triangle with a hypotenuse of $\sqrt{38}$.
a. $\sqrt{19}$
b. 19
c. $4\sqrt{19}$
d. $2\sqrt{19}$

(handwritten work: triangle with 45° angle, n, $\sqrt{38} = n\sqrt{2}$;
$$\frac{\sqrt{38}}{\sqrt{2}} = \frac{n\sqrt{2}}{\sqrt{2}}$$
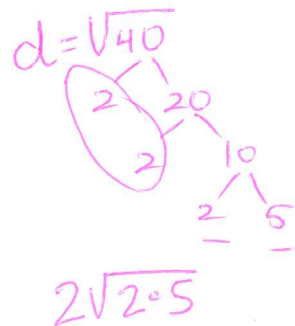$$n = \frac{\sqrt{38}}{\sqrt{2}} = \sqrt{\frac{38}{2}} = \sqrt{19}$$

14.) What is the distance between (7,3) and (1, 5)?

$x_1 y_1 \quad x_2 y_2$

a. $4\sqrt{10}$
b. $2\sqrt{10}$
c. $\sqrt{14}$
d. $10\sqrt{4}$

$d = \sqrt{(1-7)^2 + (5-3)^2}$

$d = \sqrt{(-6)^2 + 2^2}$

$d = \sqrt{36 + 4}$

$d = \sqrt{40}$

$2\sqrt{2} \cdot 5$

15.) Which of the following groups of side lengths would form a 30^0- 60^0- 90^0 triangle?

a. $5, 10, 10\sqrt{3}$
b. $5, 5, 5\sqrt{2}$
c. $5, 5\sqrt{2}, 5\sqrt{2}$
d. $5, 5\sqrt{3}, 10$

16.) Which of the following groups of side lengths would form a 45^0- 45^0- 90^0 triangle?

e. $5, 10, 10\sqrt{3}$
f. $5, 5, 5\sqrt{2}$
g. $5, 5\sqrt{2}, 5\sqrt{2}$
h. $5, 5\sqrt{3}, 10$

Solve the following problems using special right triangles, draw a picture.

17.) A right triangle has a 60 degree angle, and the leg adjacent to that angle has a length of 7 in. Find the length of the other leg.
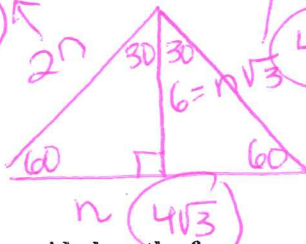
18.) A right triangle has a 45 degree angle, and the hypotenuse has a length of 8 ft. Find the length of a leg.

19.) The hypotenuse of a right triangle with a 30 degree angle has a length of 9 cm. What is the length of the leg adjacent to the 30 degree angle?

20.) The height of an equilateral triangle is 6 in. Find the perimeter of the triangle. [Draw a picture and use the properties of special triangles]

Exact

$2 \cdot 2\sqrt{3}$

$\boxed{4\sqrt{3}}$

$2n$

$\dfrac{6}{\sqrt{3}} = \dfrac{n\sqrt{3}}{\sqrt{3}}$

$30 \quad 30$

$6 = n\sqrt{3}$ $\boxed{4\sqrt{3}}$ $n = \dfrac{6}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{6\sqrt{3}}{3} = 2\sqrt{3}$

$60 \qquad 60$

$n \quad \boxed{4\sqrt{3}}$

$P = 4\sqrt{3} + 4\sqrt{3} + 4\sqrt{3} = \boxed{12\sqrt{3}}$ in

State if the three side lengths form an acute, obtuse, or right triangle.

19.) 6 mi, $2\sqrt{55}$ mi, 17 mi

≈ 14.8

$6^2 + (2\sqrt{55})^2 \overset{?}{=} 17^2$

$36 + (4 \cdot 55) \overset{?}{=} 289$

$36 + 220 = 289$

$256 < 289$ （OBTUSE）

20.) 4.8 km, 28.6 km, 29 km

$(4.8)^2 + (28.6)^2 \overset{?}{=} 29^2$

$23.04 + 817.96 = 841$

$841 = 841$

（Right）

Round to tenths

Use Pythagorean Theorem to find the missing segments of each triangle.
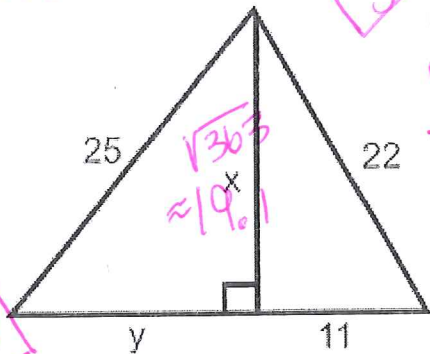
21.) $x = 19.1$ $\qquad y = 16.2$

Exact would be $11\sqrt{3}$

Exact would be $\sqrt{262}$

To find

$y: y^2 + (\sqrt{363})^2 = 25^2$

$y^2 + 363 = 625$

$\sqrt{y^2} = \sqrt{262}$

$\boxed{y \approx 16.2}$

25 $\sqrt{363}$ ≈ 19.1 x 22

To find

$x: 11^2 + x^2 = 22^2$

$121 + x^2 = 484$

$\sqrt{x^2} = \sqrt{363}$

$x = \sqrt{363}$

$\boxed{x \approx 19.1}$
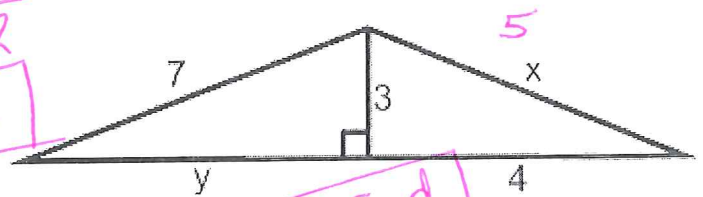
y 11

Exact $\sqrt{363}$

3 121

11 11

$11\sqrt{3}$

$\sqrt{262}$

2 131

22.) $x = 5$ $\qquad y = 6.3$

Exact would be $2\sqrt{10}$

7 $\quad$ 3 $\quad$ 5 $\quad x$

y $\qquad$ 4

To find

$x: 3^2 + 4^2 = x^2$

$9 + 16 = x^2$

$\sqrt{25} = \sqrt{x^2}$

$\boxed{5 = x}$

To find

$y:$

$3^2 + y^2 = 7^2$

$9 + y^2 = 49$

$\sqrt{y^2} = \sqrt{40} \approx 6.3$

$y = \sqrt{40}$

$2\sqrt{10}$

40

20 $\quad$ 2

10 $\quad$ 2

5