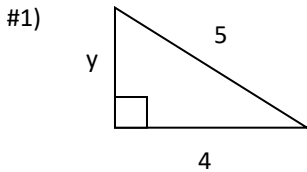


Right Triangles – Pythagorean Theorem

Homework Section 8.2

Name _____

Use the Pythagorean Theorem to find the missing measure.
Give exact answers and rounded answers (if needed) to one decimal place.



$$x^2 + y^2 = c^2$$

$$(4)^2 + y^2 = (5)^2$$

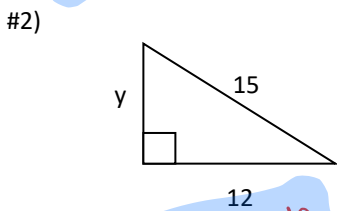
$$16 + y^2 = 25$$

$$y^2 = 9$$

$$y = \pm 3$$

$$y = 3$$

Pythagorean Triple
3-4-5



$$x^2 + y^2 = c^2$$

$$(12)^2 + y^2 = (15)^2$$

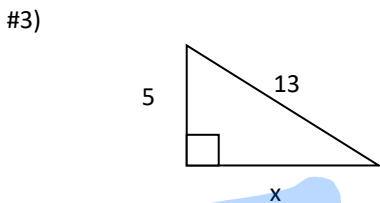
$$144 + y^2 = 225$$

$$y^2 = 81$$

$$y = \pm 9$$

$$y = 9$$

Pythagorean Triple
9-12-15



$$x^2 + y^2 = c^2$$

$$x^2 + (5)^2 = (13)^2$$

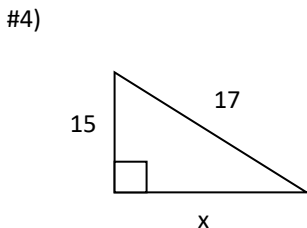
$$x^2 + 25 = 169$$

$$x^2 = 144$$

$$x = \pm 12$$

$$x = 12$$

Pythagorean Triple
5-12-13



$$x^2 + y^2 = c^2$$

$$x^2 + (15)^2 = (17)^2$$

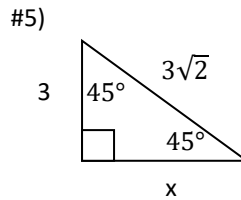
$$x^2 + 225 = 289$$

$$x^2 = 64$$

$$x = \pm 8$$

$$x = 8$$

Pythagorean Triple
8-15-17



$$x^2 + y^2 = c^2$$

$$x^2 + (3)^2 = (3\sqrt{2})^2$$

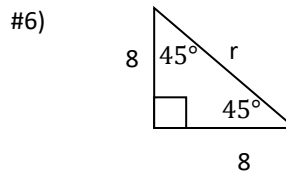
$$x^2 + 9 = 9 \cdot 2$$

$$x^2 + 9 = 18$$

$$x^2 = 9$$

$$x = \pm 3$$

$$x = 3$$



$$x^2 + y^2 = c^2$$

$$(8)^2 + (8)^2 = r^2$$

$$64 + 64 = r^2$$

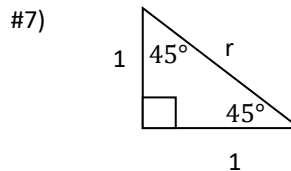
$$128 = r^2$$

$$\pm \sqrt{128} = r$$

$$\sqrt{2 \cdot 64} = r$$

$$8\sqrt{2} = r$$

$$r \approx 11.3$$



$$x^2 + y^2 = c^2$$

$$(1)^2 + (1)^2 = r^2$$

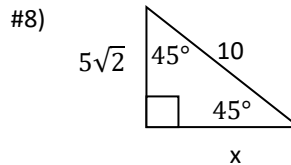
$$1 + 1 = r^2$$

$$2 = r^2$$

$$\pm \sqrt{2} = r$$

$$\sqrt{2} = r$$

$$1.4 \approx r$$



$$x^2 + y^2 = c^2$$

$$x^2 + (5\sqrt{2})^2 = (10)^2$$

$$x^2 + 25 \cdot 2 = 100$$

$$x^2 + 50 = 100$$

$$x^2 = 50$$

$$x = \pm \sqrt{50}$$

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

$$x = 5\sqrt{2}$$

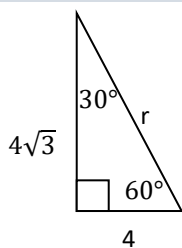
$$x \approx 7.1$$

Right Triangles – Pythagorean Theorem

Homework Section 8.2

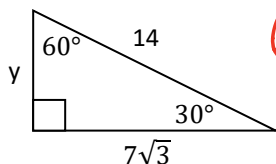
Name _____

#9)



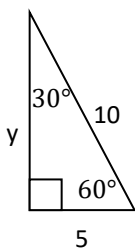
$$\begin{aligned} x^2 + y^2 &= r^2 \\ (4)^2 + (4\sqrt{3})^2 &= r^2 \\ 16 + 16 \cdot 3 &= r^2 \\ 16 + 48 &= r^2 \\ 64 &= r^2 \\ \pm 8 &= r \\ \mathbf{8} &= r \end{aligned}$$

#10)



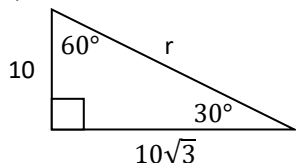
$$\begin{aligned} x^2 + y^2 &= r^2 \\ (7\sqrt{3})^2 + y^2 &= (14)^2 \\ 49 \cdot 3 + y^2 &= 196 \\ 147 + y^2 &= 196 \\ y^2 &= 49 \\ y &= \pm 7 \\ \mathbf{y} &= \mathbf{7} \end{aligned}$$

#11)



$$\begin{aligned} x^2 + y^2 &= r^2 \\ (5)^2 + y^2 &= (10)^2 \\ 25 + y^2 &= 100 \\ y^2 &= 75 \\ y &= \pm \sqrt{75} \\ y &= \sqrt{25 \cdot 3} \\ \mathbf{y} &= \mathbf{5\sqrt{3}} \\ \mathbf{y} &\approx \mathbf{8.7} \end{aligned}$$

#12)



$$\begin{aligned} x^2 + y^2 &= r^2 \\ (10\sqrt{3})^2 + (10)^2 &= r^2 \\ 100 \cdot 3 + 100 &= r^2 \\ 300 + 100 &= r^2 \\ 400 &= r^2 \\ \pm 20 &= r \\ \mathbf{20} &= r \end{aligned}$$

Determine if the following measures can form a right triangle.

#13) 18, 24, 30

$$\begin{aligned} x^2 + y^2 &= r^2 \\ (18)^2 + (24)^2 &= (30)^2 \\ 324 + 576 &= 900 \\ 900 &= 900 \end{aligned}$$

Yes, this forms a right triangle.

#14) 21, 29, 20

$$\begin{aligned} x^2 + y^2 &= r^2 \\ (20)^2 + (21)^2 &= (29)^2 \\ 400 + 441 &= 841 \\ 841 &= 841 \end{aligned}$$

Yes, this forms a right triangle.

#15) 6, 8, 10

$$\begin{aligned} x^2 + y^2 &= r^2 \\ (6)^2 + (8)^2 &= (10)^2 \\ 36 + 64 &= 100 \\ 100 &= 100 \end{aligned}$$

Yes, this forms a right triangle.

#16) 1, 2, 3

$$\begin{aligned} x^2 + y^2 &= r^2 \\ (1)^2 + (2)^2 &= (3)^2 \\ 1 + 4 &= 9 \\ 5 &\neq 9 \end{aligned}$$

No, this does not form a right triangle.

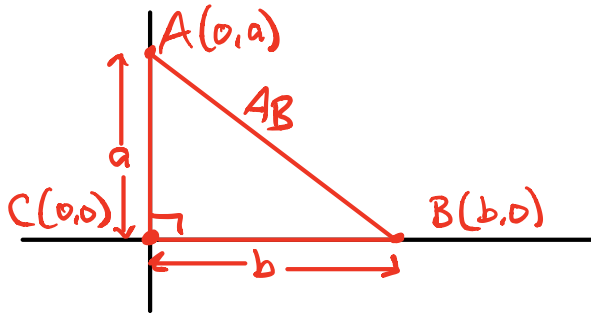
Right Triangles – Pythagorean Theorem

Homework Section 8.2

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You must draw a picture for each of following problems, then answer the questions.

#17) Draw a right triangle with vertices $A(0, a)$, $C(0, 0)$, and $B(b, 0)$ on a coordinate plane. Use the Pythagorean Theorem to derive a formula for the distance between A and B.



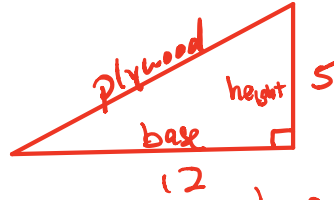
$$x^2 + y^2 = r^2$$

$$b^2 + a^2 = (AB)^2$$

$$\pm \sqrt{b^2 + a^2} = AB$$

$$AB = \sqrt{b^2 + a^2}$$

#18) Herbert is making a ramp to try out his car for the Gnaden derby. The ramp support forms a right angle. The base is 12 feet long and the height is 5 feet. What length of plywood does he need to complete the ramp?



$$\text{base}^2 + \text{height}^2 = \text{plywood}^2$$

$$(12)^2 + (5)^2 = \text{plywood}^2$$

$$144 + 25 = \text{plywood}^2$$

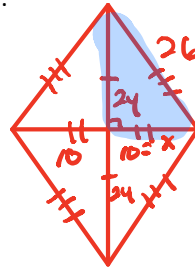
$$169 = \text{plywood}^2$$

$$\pm 13 = \text{plywood}$$

$$13 = \text{plywood}$$

The plywood is 13 feet long.

#19) The diagonal of a rhombus is 48 cm long, and a side of the rhombus is 26 cm long. Find the length of the other diagonal.



$$x^2 + y^2 = r^2$$

$$x^2 + (24)^2 = (26)^2$$

$$x^2 + 576 = 676$$

$$x^2 = 100$$

$$x = \pm 10$$

$$x = 10$$

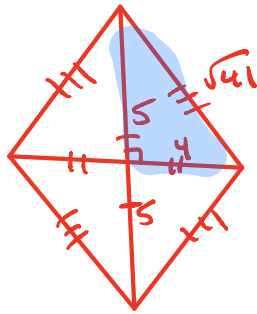
The other diagonal is 20 cm long.

Right Triangles – Pythagorean Theorem

Homework Section 8.2

Name _____

#20) The diagonals of a rhombus measure 10 cm and 8 cm. Use the properties of a rhombus and the Pythagorean Theorem to find the perimeter of the rhombus.



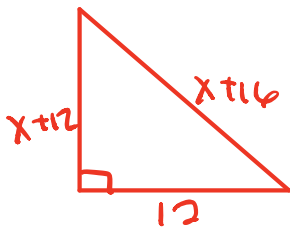
$$\begin{aligned}x^2 + y^2 &= r^2 \\(4)^2 + (5)^2 &= r^2 \\16 + 25 &= r^2 \\41 &= r^2 \\\pm\sqrt{41} &= r \\\sqrt{41} &= r\end{aligned}$$

$$P = 4r$$

$$P = 4(\sqrt{41})$$

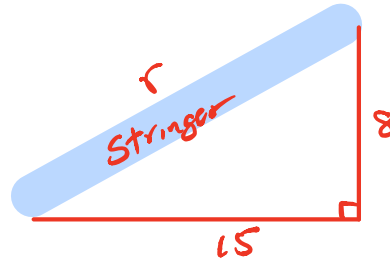
The perimeter is $4\sqrt{41}$ cm.

#21) In a right triangle, the measures of the legs are 12 and $x + 12$, and the measure of the hypotenuse is $x + 16$. Find the value of x .



$$\begin{aligned}x^2 + y^2 &= r^2 \\(12)^2 + (x+12)^2 &= (x+16)^2 \\144 + x^2 + 24x + 144 &= x^2 + 32x + 256 \\x^2 + 24x + 288 &= x^2 + 32x + 256 \\288 &= 8x + 256 \\32 &= 8x \\4 &= x\end{aligned}$$

#22) A stair stringer is a board that supports stairs. Suppose a set of stairs is to rise 8 feet over a length of 15 feet. Find the length of the stair stringer to the nearest foot.



$$\begin{aligned}x^2 + y^2 &= r^2 \\(15)^2 + (8)^2 &= r^2 \\225 + 64 &= r^2 \\289 &= r^2 \\\pm 17 &= r \\17 &= r\end{aligned}$$

The stringer is 17 feet long.