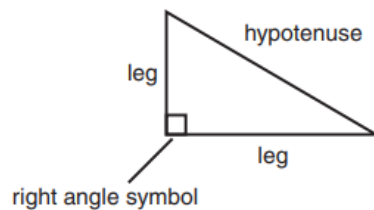# Grade 6 Gifted

Day 4 thru 11

Content Standard(s)	**8.GM.6** - Use models to demonstrate a proof of the Pythagorean Theorem and its converse. **8.GM.7 -** Apply the Pythagorean Theorem to model and solve real-world and mathematical problems in two and three dimensions involving right triangles **8.GM.8** - Find the distance between any two points in the coordinate plane using the Pythagorean Theorem.
Learning Target	I can use models to demonstrate a proof of the Pythagorean Theorem and its converse. I can apply the Pythagorean Theorem to model and solve real-world and mathematical problems in two and three dimensions involving right triangle
Essential Question	How can geometry be used to solve problems about real-world situations, spatial relationships, and logical reasoning? How might geometric concepts be represented algebraically?
Resources	Student textbooks (Course 3 Vol. 1), Skills Practice Pages and calculators maybe needed.

Learning Activities	**The Pythagorean Theorem**
	Day Four
	   1. Review the attached Notes below for Day 4
	   2. Complete Lesson 6.1 – Problem 1 p.314
	   3. Complete Skills Practice 6.1 p.1-2
	
	Day Five
	   1. Review attached Example #1 below
	   2. Complete Lesson 6.1 – Problem 4 p.331-333
	   3. Complete Skills Practice 6.1 p.6-7
	
	Day Six
	   1. Complete Lesson 6.1 – Problem 5 p. 334
	   2. Complete Skills Practice 6.1 p.9-10
	
	Day Seven
	   1. Review the attached Notes below for Day 7
	   2. Complete Lesson 6.2 – Problem 1 p.336-337
	   3. Complete Skills Practice 6.2 p.1-2
	
	Day Eight
	   1. Complete Lesson 6.2 – Problem 2 p.338-340
	   2. Review attached Example #2 below
	   3. Complete Skills Practice 6.2 p.4-5
	
	Day Nine
	   1. Complete Lesson 6.2 – Problem 2 p.341-342
	   2. Complete Skills Practice 6.2 p.8-9

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	Day Ten 1. Complete Lesson 6.3 – Problems 1 and Problem 2 p.344-345 2. Review attached Example #3 and #4 below 3. Complete Skills Practice 6.3 p.3, 5 *Day Eleven* 1. Complete Lesson 6.3 – Problems 3 and Problem 4 p.346-348 2. Review attached Example #24 and #5 below 3. Complete Skills Practice 6.3 p.8-9
Extension Activities	➢ Work on completing at least 3 ALEKS topics per day ➢ Complete Lesson 6.1 Problem 2 and Problem 3 p. 315-330

NOTES - Day 4

A **right triangle** is a triangle with a right angle. A **right angle** has a measure of 90° and is indicated by a square drawn at the corner formed by the angle. A **leg** of a right triangle is either of the two shorter sides. Together, the two legs form the right angle of a right triangle. The **hypotenuse** of a right triangle is the longest side. The hypotenuse is opposite the right angle.
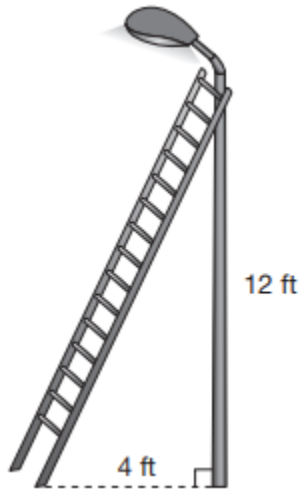

The **Pythagorean Theorem** states that if a and b are the lengths of the legs of a right triangle and c is the length of the hypotenuse, then $a^2 + b^2 = c^2$.
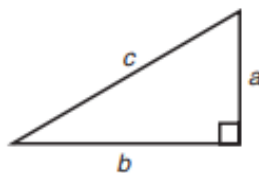
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Example #1

Clayton is responsible for changing the broken light bulb in a streetlamp. The streetlamp is 12 feet high. Clayton places the base of his ladder 4 feet from the base of the streetlamp. Clayton can extend his ladder from 10 feet to 14 feet. How long must his ladder be to reach the top of the streetlamp? Round your answer to the nearest hundredth.

$$c^2 = a^2 + b^2$$

$$c^2 = 4^2 + 12^2$$

$$c^2 = 16 + 144$$

$$c^2 = 160$$

$$c \approx 12.65$$

12 ft

4 ft

Clayton must extend his ladder about 12.65 feet.

Notes – Day 7

The **converse** of a theorem is created when the if-then parts of that theorem are exchanged.

The **Converse of the Pythagorean Theorem** states that if $a^2 + b^2 = c^2$, then the triangle is a right triangle.

If the lengths of the sides of a triangle satisfy the equation $a^2 + b^2 = c^2$, then the triangle is a right triangle.

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Examples #2

A computer monitor is sold by the diagonal length of the screen. A computer monitor has a 15-inch screen. The screen has a width of 13 inches. What is the height of the screen? Round your answer to the nearest tenth.

$$a^2 + b^2 = c^2$$

$$a^2 + 13^2 = 15^2$$

$$a^2 + 169 = 225$$

$$a^2 = 56$$

$$a = \sqrt{56}$$

$$a \approx 7.5$$

The height of the computer monitor screen is about 7.5 inches.

Example #3

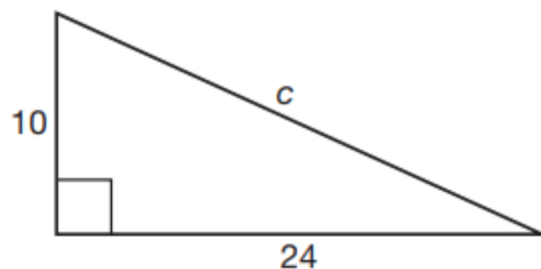Determine the length of the hypotenuse of each given triangle.

$$c^2 = 10^2 + 24^2$$

$$c^2 = 100 + 576$$

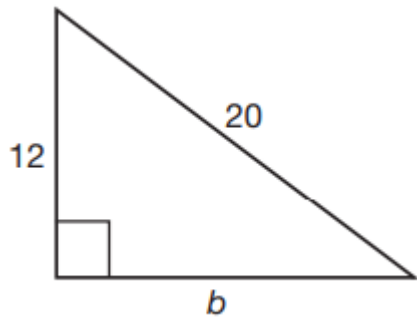$$c^2 = 676$$

$$c = \sqrt{676}$$

$$c = 26$$

The length of the hypotenuse is 26 units.

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Example #4

Determine each unknown leg length.
whether each given triangle is a right triangle

$$12^2 + b^2 = 20^2$$
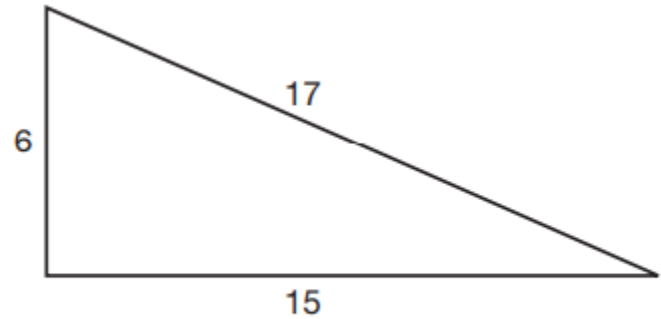
$$144 + b^2 = 400$$

$$b^2 = 400 - 144$$

$$b^2 = 256$$

$$b = \sqrt{256}$$

$$b = 16$$

Example #5

Use the Pythagorean Theorem to determine

$$6^2 + 15^2 \overset{?}{=} 17^2$$

$$36 + 225 \overset{?}{=} 289$$

$$261 \neq 289$$

The triangle is not a right triangle.