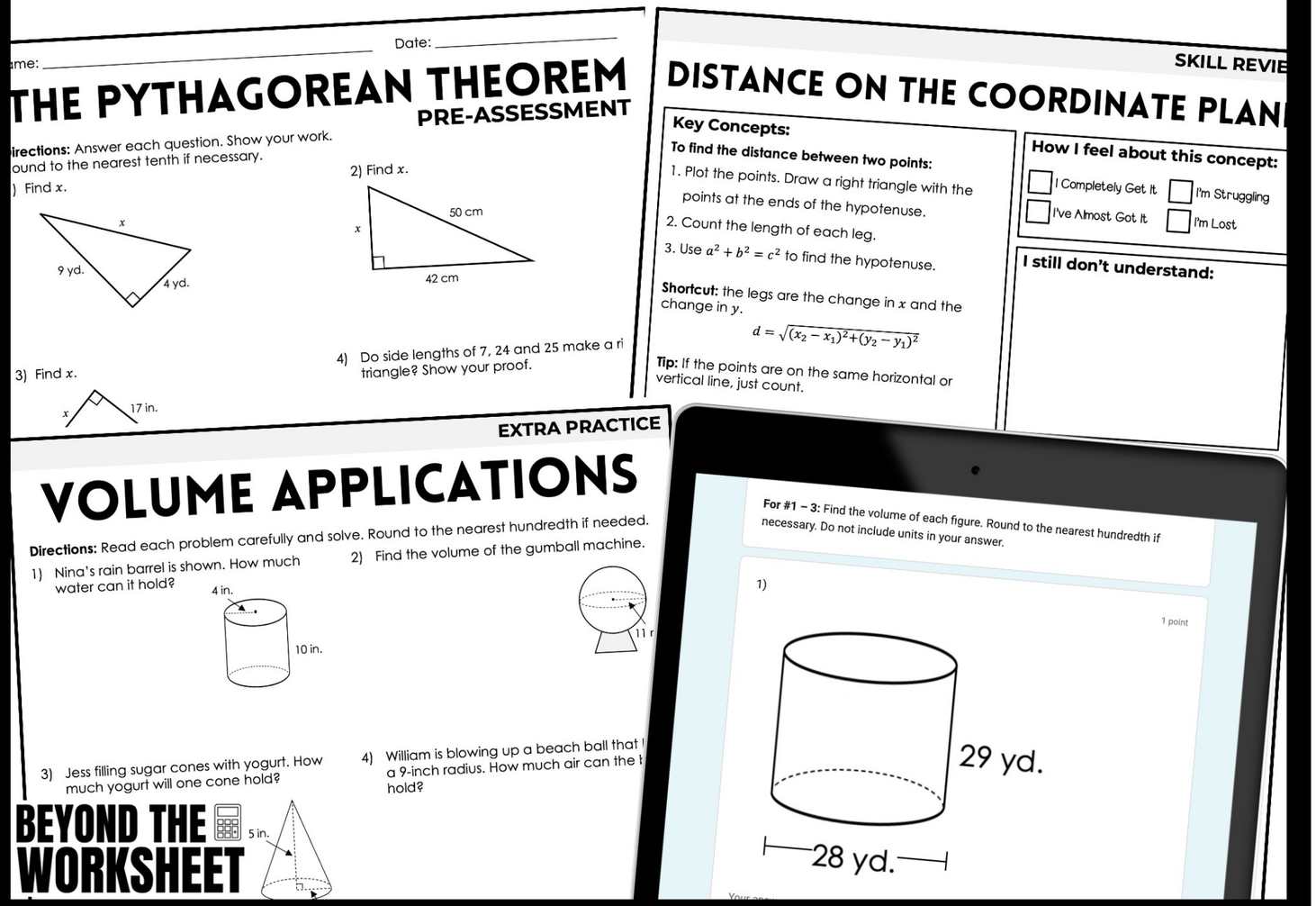
8TH GRADE MATH INTERVENTION UNIT

GEOMETRY



PRE + POST ASSESSMENTS • 7 TARGETED SKILLS • ERROR ANALYSIS

This 8th grade math intervention unit gives you two pre-assessments that pinpoint each student's gaps, and short, focused pages to reteach only the skills they missed. It covers the Pythagorean Theorem, its converse, distance, and volume.

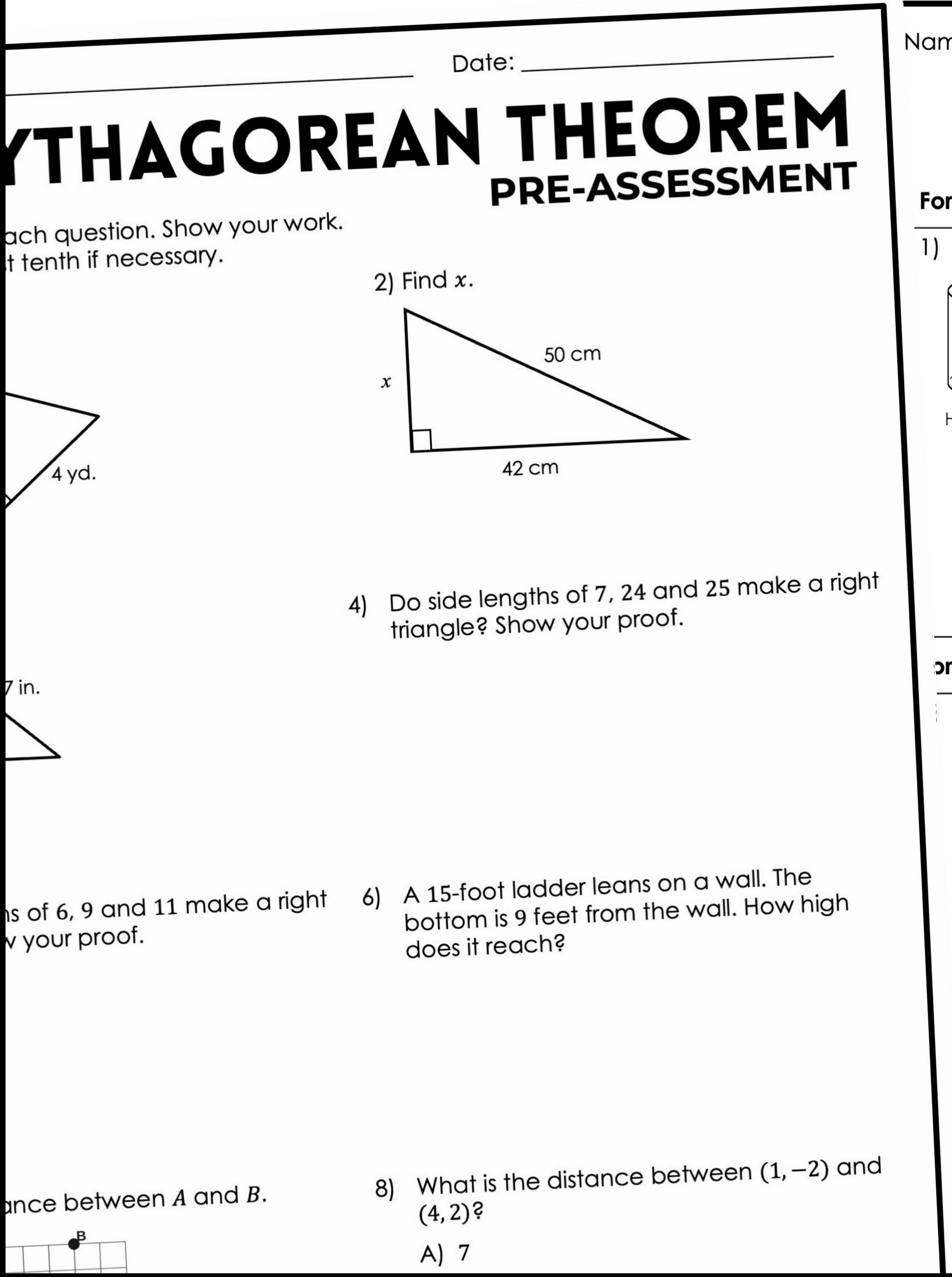
learn more!

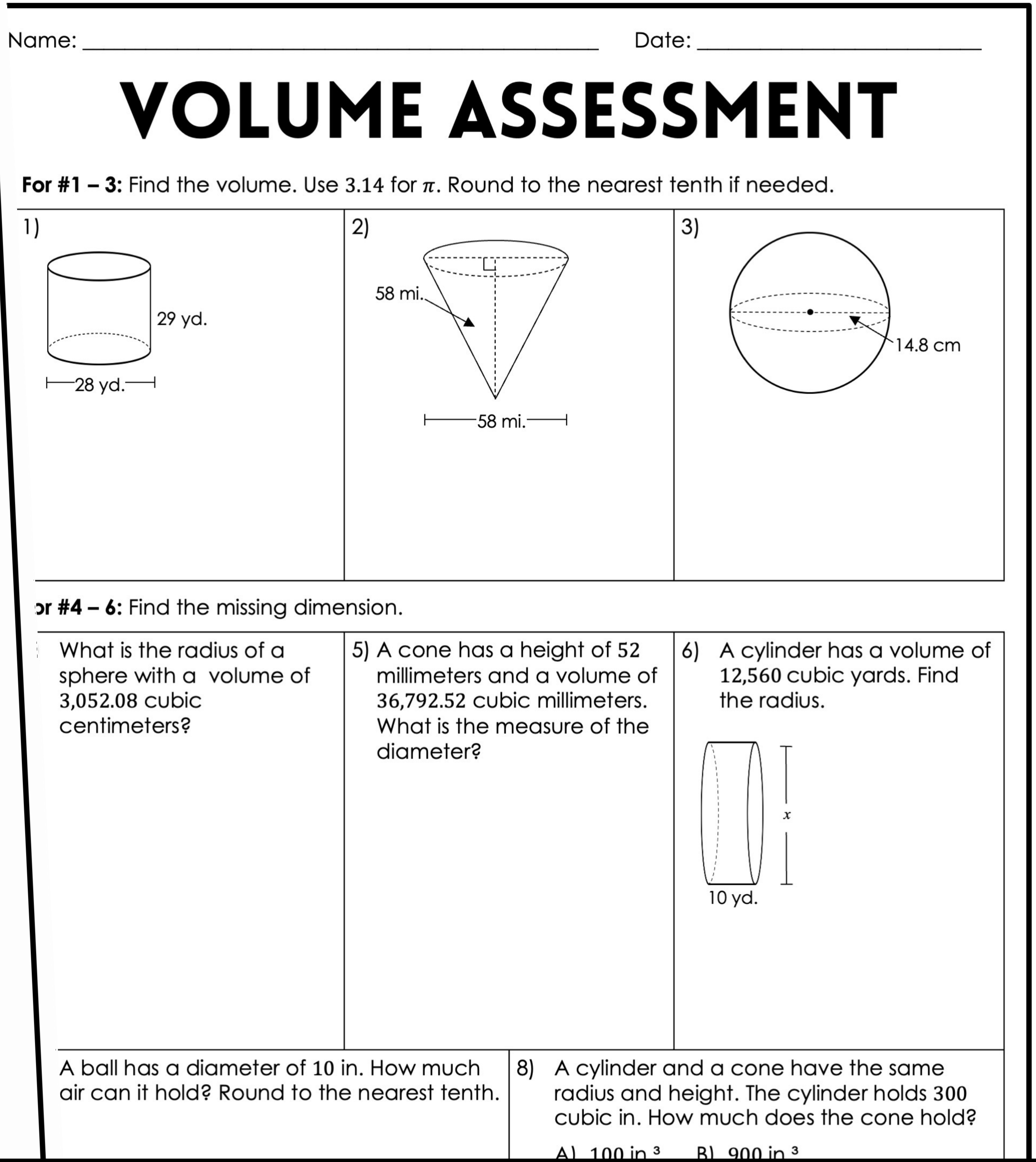
WHAT'S INCLUDED:

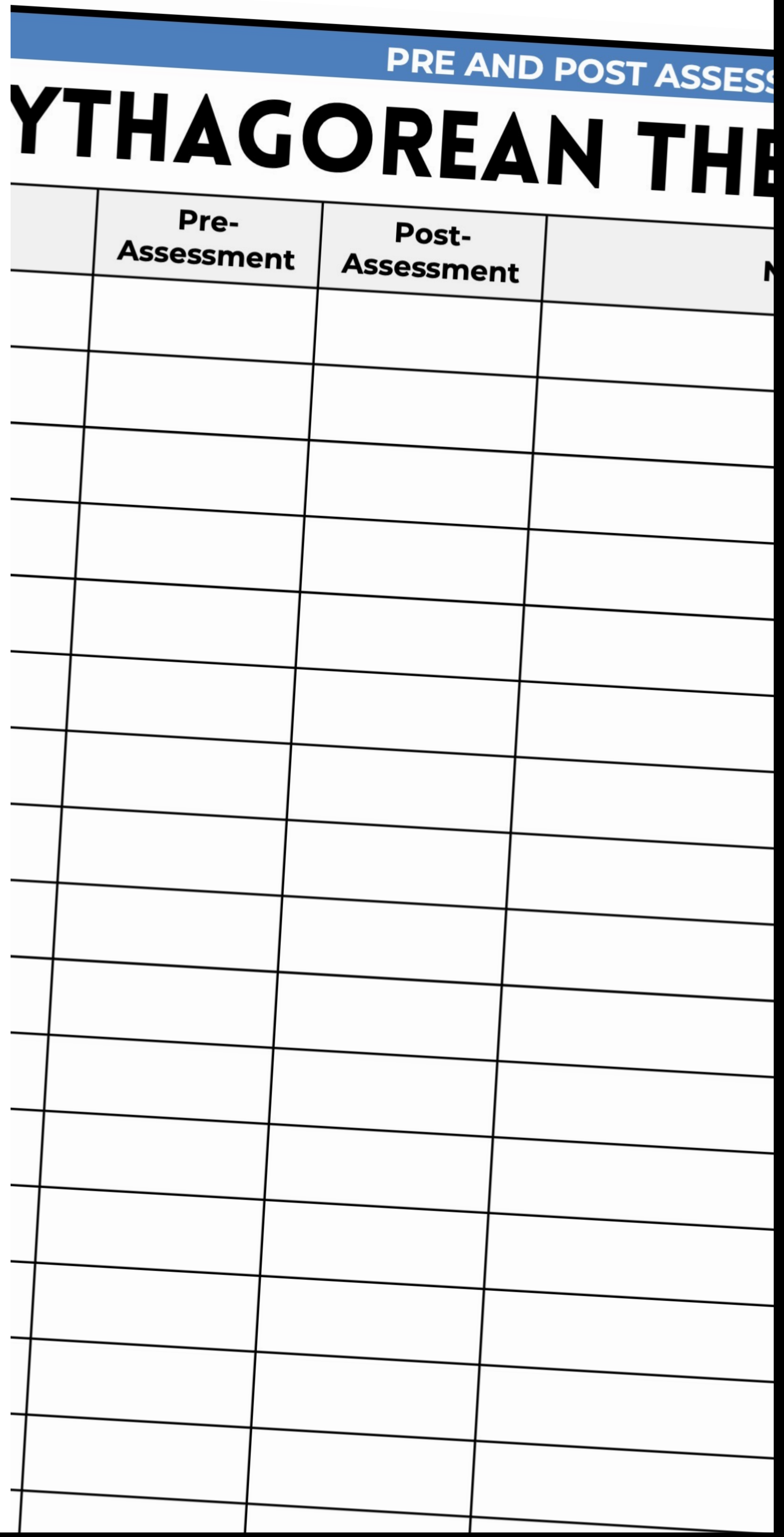
- **Intervention Planning Sheets**
  Three planning formats are included to help organize intervention groups, targeted skills, and instructional plans.
- **Pre and Post Assessments**
  Use the pre-assessment to identify individual skill gaps and the post-assessment to measure growth after intervention. In print and Google Forms.
- **Skill Review**
  A concise review of the skill with key concepts, guided practice, and a student self-assessment.
- **Extra Practice**
  Additional problems for independent, pairs or small group practice.
- **Error Analysis**
  Students analyze incorrect work, identify the mistake, and determine the correct solution.
- **Progress Tracking**
  Record student performance across the Skill Review, Extra Practice, and Error Analysis pages.
- **Editable Version**
  Adjust wording and problems to perfectly meet your standards or student needs.

Resource	Pages
Resource Details	2 – 4
Intervention Plan Sheets	5 – 7
Tracking Sheets for Assessments	8, 27
The Pythagorean Theorem Pre-Assessment	9
The Pythagorean Theorem	10 – 13
Converse of the Pythagorean Theorem	14 – 17
Pythagorean Applications	18 – 21
Distance on the Coordinate Plane	22 – 25
The Pythagorean Theorem Post-Assessment	26
Volume Pre-Assessment	28
Volume of Cylinders, Cones, and Spheres	29 – 32
Missing Dimensions	33 – 36
Volume Applications	37 – 40
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PRE & POST ASSESSMENTS







SKILLS REVIEW PAGES

SKILL REVIEW

THAGOREAN THEOREM

triangle with one 90° angle.
that make the right angle are
d b.
ss from the right angle is the
c. It is always the longest side.

eorem: $a^2 + b^2 = c^2$
otenuse: square the legs, add,
e square root.
quare the hypotenuse, subtract
ared, then take the square root.

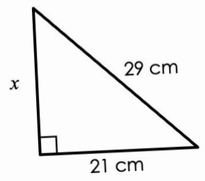
nd 8. $6^2 + 8^2 = c^2$
$100 = c^2$
$c = 10$

How I feel about this concept:

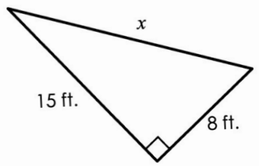
- ☐ I Completely Get It
- ☐ I'm Struggling
- ☐ I've Almost Got It
- ☐ I'm Lost

I still don't understand:

2) Find x.



3) Find x.



27 in.

a right triangle
nd 7 cm. Find
enuse. Round to
t tenth.

5) Find b.
$6^2 + b^2 = 10^2$

6) Which equation finds the hypotenuse of a right triangle with legs 3 and 4?

A) $3 + 4 = c$

B) $3^2 + 4^2 = c^2$

SKILL REVIEW

CONVERSE OF THE PYTHAGOREAN THEOREM

Key Concepts:

Converse: if $a^2 + b^2 = c^2$, the triangle is a right triangle.

Steps:

1. Find the longest side. That is c.
2. Square the two shorter sides and add them.
3. Square the longest side.
4. If the answers are equal, it is a right triangle. If not, it is not.

Example: Side lengths of 5, 12, 13.

$25 + 144 = 169$ and $13^2 = 169$.

is a right triangle.

How I feel about this concept:

- ☐ I Completely Get It
- ☐ I'm Struggling
- ☐ I've Almost Got It
- ☐ I'm Lost

I still don't understand:

Practice:

For #1 – 4: State whether the given side lengths belong to a right triangle.

1) 3, 4, 5

yes
no

2) 5, 6, 8

yes
no

3) 9, 12, 15

yes
no

4) 7, 24, 25

yes
no

Which set of side lengths makes a right triangle?

A) 8, 15, 17 B) 2, 3, 4

C) 6, 7, 9 D) 4, 5, 7

6) Fill in the blank so the sides make a right triangle.

6, 8, _____

OREAN THEOREM APPLIC

angle in the problem. Walls and
s, and boxes all make right

Mark the right angle.
d the hypotenuse.
Solve for the missing side.
ion with units.

nd the diagonal of the bottom
eg with the height.

How I feel abou

- ☐ I Completely Get It
- ☐ I've Almost Got It

I still don't unde

eans on a wall. The
om the wall. How high
the ladder reach?

2) A TV screen is 40 inches wi
inches tall. Find the length
diagonal.

40

east and 8 blocks
e from where she
t line?

4) A kite string is 100 feet long.
feet away from you on the
high is the kite?

A) 40 ft B) 80 ft

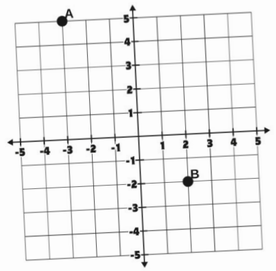
C) 160 ft D) 116.6 ft

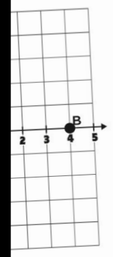
EXTRA PRACTICE

E ON THE COORDINATE PLANE

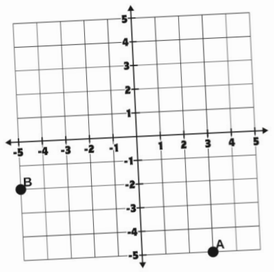
distance between the points. Round to the nearest tenth if needed.

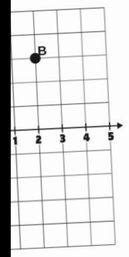
2)





4)





d each problem carefully.

ance between $(-3, 4)$ and
u need the Pythagorean
xplain.

6) On a map, school is at $(2, 3)$ and the library is at $(8, 11)$. Each unit is 1 mile. How far apart are they?

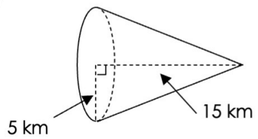
distance between $(-1, -1)$

8) Ava counted the squares along the slanted line from $(0, 0)$ to $(3, 4)$ and got 4. What did she do wrong?

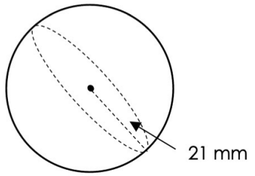
VOLUME OF CYLINDERS, CONES, AND SPHERES

For #1 – 6: Find the volume. Round to the nearest tenth if needed.

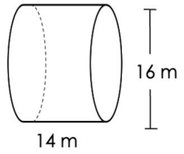
1)



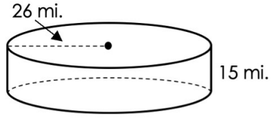
2)



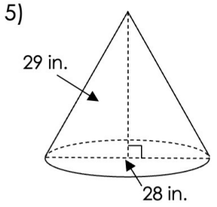
3)



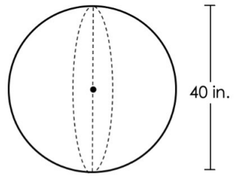
4)



5)



6) Half of the sphere (hemisphere)



or #7 – 10: Read each problem carefully.

What is the volume of a sphere with a radius of 4?

A) 267.95 B) 50.24

C) 66.99 D) 803.84

8) A cone holds $\frac{1}{3}$ of a cylinder with the same radius and height.

always	sometimes	never

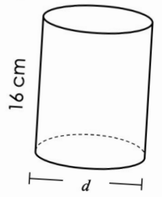
A cylinder's radius doubles. Does the volume double? Explain.

10) Find the volume of a cylinder with a radius of 2 m and a height of 10 m.

SING DIMENSIO

missing dimension.

ter of the cylinder if it has a
5 cubic cm.



2) Find the height of the c
volume of 301.44 cubic

f a cylinder with a radius
ume of 125.6 cubic m.

4) Find the radius of a spher
of 523.33 cubic ft.

h problem carefully.

ght of 9 yd and a
ubic yd. Find the radius.

6) A soup can holds 1,004.8 c
radius is 4 cm. How tall is th

$528\ m^3$ and $h = 8\ m$.

8) Leo found the radius of a cy
$r^2 = 49$ and said $r = 49$. Wh
forget?

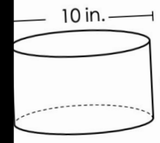
ERROR ANALYSIS

ERROR ANALYSIS

UME APPLICATIONS

he error. Then explain it and solve the problem correctly.

d fits in the container?



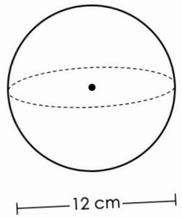
r:
$3.14(10^2)(6)$
$= 1{,}884$ in.^{3}

2) A cone has a radius of 3 cm and a height of 6 cm. How much can it hold?

Student answer:

$$V = \frac{1}{3}(3.14)(3)(6)$$
$$V = 18.84 \text{ cm}^3$$

ir does the ball hold?



wer:
$= \frac{4}{3}(3.14)(12^3)$
$V = 7{,}234.56$ cm^3

4) A pool is cylinder shaped with a radius of 10 feet and a depth of 4 feet. How much water does it hold?

Student answer:

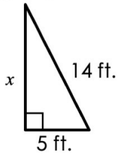
$$V = 3.14(10^2)$$
$$V = 314 \text{ ft}^3$$

ERROR ANALYSIS

PYTHAGOREAN THEOREM APPLICATIONS

Directions: Identify the error. Then explain it and solve the problem correctly.

1) A 14-foot board braces a tree. The bottom is 5 feet from the tree. How high up the tree does it reach?



Student answer:

$$14^2 + 5^2 = x^2$$
$$221 = x^2$$
$$x \approx 14.9 \text{ ft}$$

2) Two cars leave the same spot. One drives 21 mi north. The other drives 20 mi east. How far apart are they?

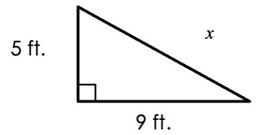
Student answer:

$$21 + 20 = 41 \text{ mi}$$

A square table has sides of 4 ft. How far is it from one corner to the opposite corner?

Student answer: $4^2 + 4^2 = x^2$
$32 = x^2$
$x = 16$ ft

4) A staircase rises 5 ft and runs 9 ft. How long is the handrail?



Student answer: $9^2 - 5^2 = 56$
$\sqrt{56} \approx 7.5$
$x \approx 7.5$ ft

E

SE OF THE PYTHAGOREAN

the error. Then explain it and solve the problem correctly

ke a right triangle?

$13^2 = 194$
$^2 = 144$
ɔt a right triangle.

2) Do 12, 16, 20 make a rig

Student answer:
$12 + 16 = 28$
$28 \neq 20$
No, it is not a right

e a right triangle?

$\cdot 2 = 136$
$= 104$
a right triangle.

4) Do 14, 48, 50 make a righ

Student answer:
$14^2 + 48^2 = 2500$
No, because 2500

ght triangle?

5 is more than 6.

6) Do 18, 24, 30 make a right t

Student answer:
$18^2 + 24^2 = 900$
No, because 900 is no

TEACHER PAGES & ANSWER KEY

EXTRA PRACTICE

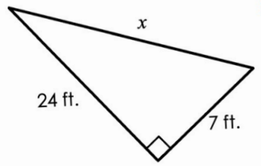
THAGOREAN THEOREM

ound to the nearest tenth if needed.

ni.

$x^2 + 16^2 = 20^2$
$x^2 = 144$
$x = 12$ mi.

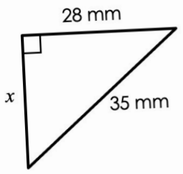
2)



$24^2 + 7^2 = x^2$
$625 = x^2$
$x = 25$ ft

$5^2 + 12^2 = x^2$
$169 = x^2$
$x = 13$ yd

4)



$x^2 + 28^2 = 35^2$
$x^2 = 441$
$x = 21$ mm

d each problem carefully.

en which two whole
plain how you know.

nd 8. 50 is between
$= 7^2$ and $64 = 8^2$.

6) A right triangle has legs of 20 and 48. What is the hypotenuse?

A) 68 B) 2,704 C) 52 D) 960

s sides of 5 inches. Find the
diagonal. Round to the
th.

$5^2 + 5^2 = c^2$
$50 = c^2$
$c \approx 7.1$ in.

8) Find the value of a.

$a^2 + 24^2 = 25^2$

$a^2 = 49$
$a = 7$

from the right

8TH GRADE MATH INTERVENTION PROGRAM

Resource: 8th Grade Math Intervention Unit 7 – Geometry

Suggested Class Time: 30 minutes at a time as needed

The Big Idea

- This unit provides **targeted intervention and additional practice** with the Pythagorean Theorem and its converse, using right triangles to solve real-world problems and find distances on the coordinate plane, and finding the volume of cylinders, cones, and spheres. The unit is split into two sections (The Pythagorean Theorem, and Volume), each with its own pre- and post-assessment. Each skill review also revisits the earlier skills students need, such as squares and square roots, exponents, and solving equations.
- Use the pre-assessment to identify specific skill gaps, then assign only the skill pages students need. The materials work best in **teacher-led small groups**, but the Extra Practice and Error Analysis pages can also be used for independent practice, partner work, reteaching, or progress monitoring.

Each skill comes with:

- **Skill Review**
  A concise review of the skill with key concepts, guided practice, and a student self-assessment.
- **Extra Practice**
  Additional problems students can complete independently, with a partner, or as continued small-group practice.

Error Analysis
Students analyze incorrect work, identify the mistake, and determine the correct solution. This provides an opportunity to uncover misconceptions that may not be obvious from a correct/incorrect answer alone.

Progress Tracking
Record student performance across the Skill Review, Extra Practice, and Error Analysis pages to monitor growth and determine next steps.

lso included:

Pre- & Post-Assessments
Use the pre-assessment to identify individual skill gaps and the post-assessment to measure growth after intervention. Print and Google Forms versions are included.

Intervention Planning Sheets
Three planning formats are included to help organize intervention groups, targeted skills, and instructional plans. These can also be used to communicate plans with interventionists, assistants, or other support staff.

GGESTED INTERVENTION FLOW
Assess → 2. Identify Skill Gaps → 3. Review & Reteach → 4. Practice → 5. Analyze Errors → 6. Reassess

ndards (CCSS)
8.G.6, 8.G.7, 8.G.8, 8.G.9
Gap skills reviewed: 6.EE.1, 7.EE.4a, 8.EE.2

Progression

equisite Skills	Skills Addressed in This Unit	Skills Students Will Build Toward
quares and square roots	• Pythagorean Theorem	• Geometry and Algebra 1

8TH GRADE MATH INTERVE

eptions & Teaching Tips

EOREM

nts adding the sides, or doubling instead of squaring.
formula every time. Say "times itself" for each square.

ts adding when they should subtract.
tenuse is always alone. Ask, "Do I know c?" If yes, subtrac

ts putting the longest side with the legs.
longest side first. That side is always c.

counting squares along a slanted line.
ght triangle. Count the legs only, never the slanted side.

using the diameter as the radius, or forgetting the 1/3 fo
d before starting. Say "cone = one-third of a cylinder."

topping at $r^2 = 25$ or $r^3 = 27$.
e yet?" Finish with the square root or cube root.