Geometry Unit 4 Student Workbook — Visual Support Edition

Similarity and Right Triangle Trigonometry

What is different in this version?

This workbook includes corrected diagram markings, stronger visual scaffolds, image anchors, “draw this first” directions, and integrated skills checks inside each lesson.

Lesson sequence

4.1 Identifying Similar Figures
4.2 Proportions in Similar Triangles
4.3 Right Triangle Similarity
4.4 Trigonometric Ratios — SOH CAH TOA
4.5 Inverse Trigonometry & Applications

Student work routine

For every lesson, do these in order:

1. Copy the visual anchor.
2. Follow the “draw this first” checklist.
3. Label known values and important angle/parallel/right-angle marks.
4. Write the rule, proportion, or trig equation.
5. Solve and check if your answer makes sense.

Performance task

At the end of the unit you will complete the Community Observation Tower task. Your score will depend heavily on your labeled drawing, not just the final answers.

4.1 Identifying Similar Figures

STRIDES notes + visual anchor

S — Subject

Write the big idea of this lesson in your own words.

T — Terms

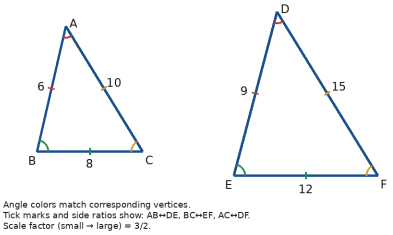
Define these words: similar polygons, corresponding sides, corresponding angles, scale factor

R — Rules

Describe these rules in your own words:

- Corresponding angles are congruent.
- Corresponding side ratios must be equal.
- State the scale factor in the order requested.

Similar triangles: clearly mark corresponding parts



Angle colors match corresponding vertices.
Tick marks and side ratios show: AB↔DE, BC↔EF, AC↔DF.
Scale factor (small → large) = 3/2.

What to draw first

- Draw both figures large enough to label.
- Mark matching angles.
- Use color or tick marks to match corresponding sides.
- Write side ratios in the same order.

Mini sketch space

Copy the visual anchor above and add your own labels or notes during class.

4.1 Identifying Similar Figures

STRIDES illustrations, definitions, example, and steps

I — Illustrations

Draw a labeled picture that represents this lesson. Follow the teacher modeling if needed.

D — Definitions / notes

Write a few notes about what the picture shows, including important relationships and vocabulary.

E — Example

Write one class example here. Include a sketch.

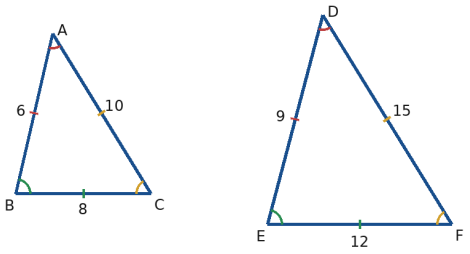
S — Steps

List the solving steps in order.

4.1 Identifying Similar Figures

Guided practice — draw first, then solve

Similar triangles: clearly mark corresponding parts



Angle colors match corresponding vertices.
Tick marks and side ratios show: AB↔DE, BC↔EF, AC↔DF.
Scale factor (small → large) = 3/2.

Draw this first

- Draw both figures large enough to label.
- Mark matching angles.
- Use color or tick marks to match corresponding sides.

Guided problem 1

Determine if side sets (4, 6, 8) and (6, 9, 12) are similar. State the scale factor small → large.

Sketch / labels / setup:

Guided problem 2

Determine if side sets (3, 4, 5) and (6, 8, 11) are similar. Explain.

Show the diagram, equation, and steps:

4.1 Identifying Similar Figures

Independent practice — include a sketch for each problem

Independent problem 1

Triangles have sides 7, 9, 12 and 14, 18, 24. Similar? State k.

Required: draw and label a supporting image before solving.

Independent problem 2

A quadrilateral has corresponding sides 4, 6, 8, 10 and 6, 9, 12, 15. State k.

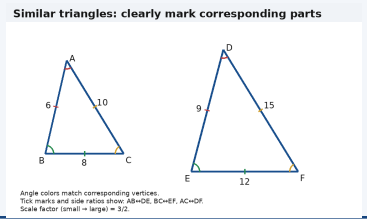
Required: draw and label a supporting image before solving.

Independent problem 3

Triangles have sides 8, 10, 12 and 12, 15, 19. Similar? Why?

Required: draw and label a supporting image before solving.

Visual reminder



4.1 Identifying Similar Figures

Integrated skills check

Skills-check directions

Show enough work to prove you are ready for the quiz. Every problem must include a labeled sketch or diagram.

Skills check A

Are triangles with sides (5, 8, 10) and (10, 16, 20) similar? State the factor from first to second.

Student drawing / setup / work:

Skills check B

Explain why sides (4, 5, 7) and (8, 10, 15) are not similar.

Student drawing / setup / work:

4.2 Proportions in Similar Triangles

STRIDES notes + visual anchor

S — Subject

Write the big idea of this lesson in your own words.

T — Terms

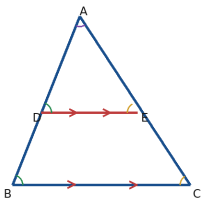
Define these words: proportion, parallel lines, triangle proportionality, corresponding sides

R — Rules

Describe these rules in your own words:

- If a segment is parallel to one side of a triangle, it forms a similar triangle.
- Write proportions with matching order only.
- Use whole sides or part sides carefully.

Parallel segment inside a triangle



Given: DE ∥ BC

Draw ABC first.
Add DE parallel to BC.
Mark equal angles to justify ΔADE ~ ΔABC.
Label split sides before writing a proportion.

What to draw first

- Draw the large triangle first.
- Add the interior segment and mark it parallel to the base.
- Label the split sides before writing a proportion.
- State the similar triangles.

Mini sketch space

Copy the visual anchor above and add your own labels or notes during class.

4.2 Proportions in Similar Triangles

STRIDES illustrations, definitions, example, and steps

I — Illustrations

Draw a labeled picture that represents this lesson. Follow the teacher modeling if needed.

D — Definitions / notes

Write a few notes about what the picture shows, including important relationships and vocabulary.

E — Example

Write one class example here. Include a sketch.

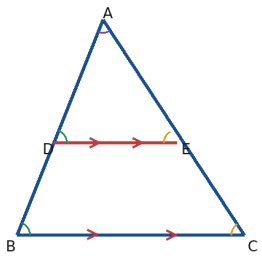
S — Steps

List the solving steps in order.

4.2 Proportions in Similar Triangles

Guided practice — draw first, then solve

Parallel segment inside a triangle



Given: DE ∥ BC

Draw ABC first.
Add DE parallel to BC.
Mark equal angles to justify ΔADE ~ ΔABC.
Label split sides before writing a proportion.

Draw this first

- Draw the large triangle first.
- Add the interior segment and mark it parallel to the base.
- Label the split sides before writing a proportion.

Guided problem 1

In a triangle, a segment parallel to the base creates a smaller similar triangle. Write one valid proportion if $\Delta ADE \sim \Delta ABC$.

Sketch / labels / setup:

Guided problem 2

Given similar triangles with corresponding sides $5 \leftrightarrow 8$ and $x \leftrightarrow 12$, solve for x.

Show the diagram, equation, and steps:

4.2 Proportions in Similar Triangles

Independent practice — include a sketch for each problem

Independent problem 1

A small triangle is similar to a large triangle with scale factor 2/3. If a corresponding side on the large triangle is 21, find the small side.

Required: draw and label a supporting image before solving.

Independent problem 2

If DE ■ BC and AD = 6, DB = 4, AE = 9, find AC.

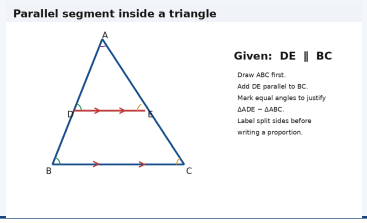
Required: draw and label a supporting image before solving.

Independent problem 3

A road sign and a scale drawing are similar. If the drawing height is 8 cm and the real sign height is 60 cm, what is the scale factor drawing → real?

Required: draw and label a supporting image before solving.

Visual reminder



4.2 Proportions in Similar Triangles

Integrated skills check

Skills-check directions

Show enough work to prove you are ready for the quiz. Every problem must include a labeled sketch or diagram.

Skills check A

Write and solve a proportion if a small triangle side is 7, the matching large triangle side is 14, and another large side is 20.

Student drawing / setup / work:

Skills check B

A segment parallel to the base cuts the sides in lengths 3 and 6 on one side. If the full matching side is 18, what is the smaller piece?

Student drawing / setup / work:

4.3 Right Triangle Similarity

STRIDES notes + visual anchor

S — Subject

Write the big idea of this lesson in your own words.

T — Terms

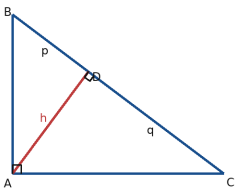
Define these words: altitude, hypotenuse, geometric mean, similar triangles

R — Rules

Describe these rules in your own words:

- An altitude drawn to the hypotenuse of a right triangle creates 3 similar triangles.
- Use a table to organize short leg, long leg, and hypotenuse.
- The altitude is the geometric mean of the hypotenuse segments.

Altitude to the hypotenuse creates 3 similar triangles



Draw order:

1. Draw one large right triangle.
2. Drop altitude h to the hypotenuse
3. Mark right angles at A and D.
4. Use p, q, and h or a side table.
5. Then write equations.

What to draw first

- Draw one right triangle.
- Drop an altitude from the right angle to the hypotenuse.
- Box the right angles.
- Trace the small, medium, and large triangles.
- Fill the table before solving.

Mini sketch space

Copy the visual anchor above and add your own labels or notes during class.

4.3 Right Triangle Similarity

STRIDES illustrations, definitions, example, and steps

I — Illustrations

Draw a labeled picture that represents this lesson. Follow the teacher modeling if needed.

D — Definitions / notes

Write a few notes about what the picture shows, including important relationships and vocabulary.

E — Example

Write one class example here. Include a sketch.

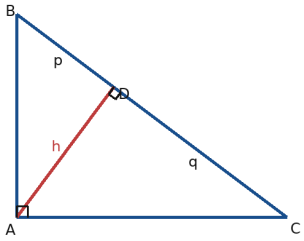
S — Steps

List the solving steps in order.

4.3 Right Triangle Similarity

Guided practice — draw first, then solve

Altitude to the hypotenuse creates 3 similar triangles



Draw order:

1. Draw one large right triangle.
2. Drop altitude h to the hypotenuse
3. Mark right angles at A and D.
4. Use p, q, and h or a side table.
5. Then write equations.

Draw this first

- Draw one right triangle.
- Drop an altitude from the right angle to the hypotenuse.
- Box the right angles.

Guided problem 1

Use a diagram to explain why the three triangles formed by an altitude to the hypotenuse are similar.

Sketch / labels / setup:

Guided problem 2

If the hypotenuse is split into segments 4 and 9, use the diagram/table to find the altitude.

Show the diagram, equation, and steps:

4.3 Right Triangle Similarity

Independent practice — include a sketch for each problem

Independent problem 1

A right triangle has hypotenuse segments 6 and 24. Find the altitude.

Required: draw and label a supporting image before solving.

Independent problem 2

A leg is the geometric mean of the hypotenuse and its adjacent hypotenuse segment. Write an equation that models this.

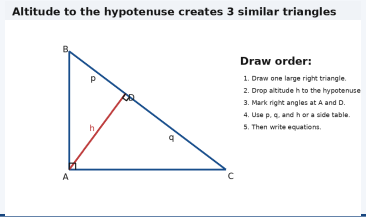
Required: draw and label a supporting image before solving.

Independent problem 3

In a right triangle, the hypotenuse is 25 and one segment is 9. Find the other segment, then identify what information would help you find a leg.

Required: draw and label a supporting image before solving.

Visual reminder



4.3 Right Triangle Similarity

Integrated skills check

Skills-check directions

Show enough work to prove you are ready for the quiz. Every problem must include a labeled sketch or diagram.

Skills check A

The altitude to the hypotenuse splits it into lengths 5 and 20. Find the altitude.

Student drawing / setup / work:

Skills check B

The hypotenuse of a right triangle is 18 and one adjacent segment is 8. Write the equation for the leg touching the segment of length 8.

Student drawing / setup / work:

4.4 Trigonometric Ratios — SOH CAH TOA

STRIDES notes + visual anchor

S — Subject

Write the big idea of this lesson in your own words.

T — Terms

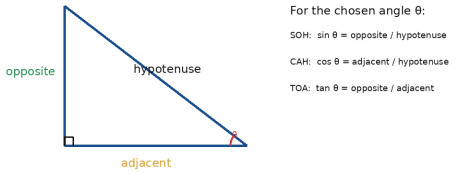
Define these words: sine, cosine, tangent, opposite, adjacent, hypotenuse

R — Rules

Describe these rules in your own words:

- sin θ = opposite / hypotenuse
- cos θ = adjacent / hypotenuse
- tan θ = opposite / adjacent
- O-A-H must be labeled relative to the chosen angle.

Label opposite, adjacent, and hypotenuse



What to draw first

- Draw the right triangle.
- Mark the reference angle.
- Label opposite, adjacent, and hypotenuse.
- Choose the ratio that uses the known and unknown sides.

Mini sketch space

Copy the visual anchor above and add your own labels or notes during class.

4.4 Trigonometric Ratios — SOH CAH TOA

STRIDES illustrations, definitions, example, and steps

I — Illustrations

Draw a labeled picture that represents this lesson. Follow the teacher modeling if needed.

D — Definitions / notes

Write a few notes about what the picture shows, including important relationships and vocabulary.

E — Example

Write one class example here. Include a sketch.

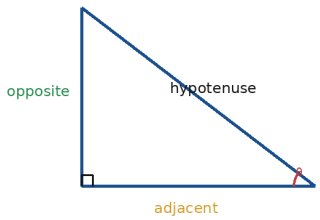
S — Steps

List the solving steps in order.

4.4 Trigonometric Ratios — SOH CAH TOA

Guided practice — draw first, then solve

Label opposite, adjacent, and hypotenuse



For the chosen angle θ:

SOH: sin θ = opposite / hypotenuse

CAH: cos θ = adjacent / hypotenuse

TOA: tan θ = opposite / adjacent

Draw this first

- Draw the right triangle.
- Mark the reference angle.
- Label opposite, adjacent, and hypotenuse.

Guided problem 1

Angle θ = 38°, hypotenuse = 20. Find the opposite side.

Sketch / labels / setup:

Guided problem 2

Angle θ = 52°, adjacent = 9. Find the hypotenuse.

Show the diagram, equation, and steps:

4.4 Trigonometric Ratios — SOH CAH TOA

Independent practice — include a sketch for each problem

Independent problem 1

Angle θ = 31°, adjacent = 14. Find the opposite side.

Required: draw and label a supporting image before solving.

Independent problem 2

Angle θ = 47°, hypotenuse = 18. Find the adjacent side.

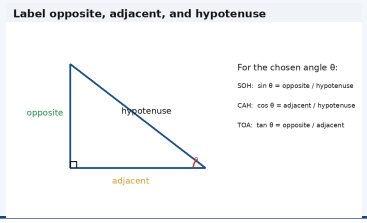
Required: draw and label a supporting image before solving.

Independent problem 3

Angle θ = 63°, opposite = 11. Find the adjacent side.

Required: draw and label a supporting image before solving.

Visual reminder



4.4 Trigonometric Ratios — SOH CAH TOA

Integrated skills check

Skills-check directions

Show enough work to prove you are ready for the quiz. Every problem must include a labeled sketch or diagram.

Skills check A

A right triangle has angle $\theta = 25°$ and adjacent side 12. Find the opposite side.

Student drawing / setup / work:

Skills check B

A right triangle has angle $\theta = 40°$ and hypotenuse 15. Find the adjacent side.

Student drawing / setup / work:

4.5 Inverse Trigonometry & Applications

STRIDES notes + visual anchor

S — Subject

Write the big idea of this lesson in your own words.

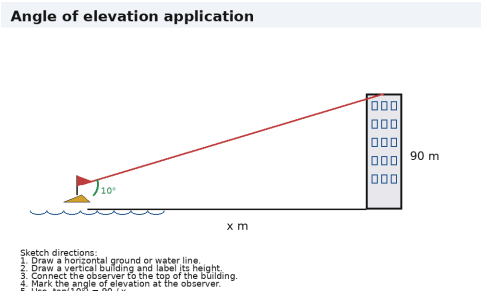
T — Terms

Define these words: inverse trig, angle of elevation, angle of depression, modeling

R — Rules

Describe these rules in your own words:

- Use inverse trig when the unknown is an angle.
- Draw angle of elevation at the observer on a horizontal line.
- Choose tan, sin, or cos based on the known sides.



What to draw first

- Translate the situation into a right triangle.
- Draw the horizontal ground/water line.
- Draw the vertical height.
- Mark the angle of elevation at the observer.
- Label the known sides before choosing a ratio.

Mini sketch space

Copy the visual anchor above and add your own labels or notes during class.

4.5 Inverse Trigonometry & Applications

STRIDES illustrations, definitions, example, and steps

I — Illustrations

Draw a labeled picture that represents this lesson. Follow the teacher modeling if needed.

D — Definitions / notes

Write a few notes about what the picture shows, including important relationships and vocabulary.

E — Example

Write one class example here. Include a sketch.

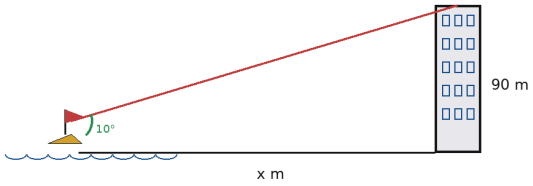
S — Steps

List the solving steps in order.

4.5 Inverse Trigonometry & Applications

Guided practice — draw first, then solve

Angle of elevation application



Sketch directions:
1. Draw a horizontal ground or water line.
2. Draw a vertical building and label its height.
3. Connect the observer to the top of the building.
4. Mark the angle of elevation at the observer.

Draw this first

- Translate the situation into a right triangle.
- Draw the horizontal ground/water line.
- Draw the vertical height.

Guided problem 1

Use side lengths 12 and 16 to find an angle with inverse tangent.

Sketch / labels / setup:

Guided problem 2

The angle of elevation from a boat to the top of a 90-meter hotel is 10°. How far is the boat from the base?

Show the diagram, equation, and steps:

4.5 Inverse Trigonometry & Applications

Independent practice — include a sketch for each problem

Independent problem 1

A ladder 12 ft long makes a 68° angle with the ground. How high does it reach?

Required: draw and label a supporting image before solving.

Independent problem 2

A tree is 30 m tall. The angle of elevation to the top is 25°. How far is the observer from the tree?

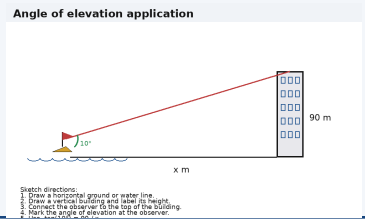
Required: draw and label a supporting image before solving.

Independent problem 3

A ramp rises 4 ft over a horizontal distance of 10 ft. Find the angle of elevation of the ramp.

Required: draw and label a supporting image before solving.

Visual reminder



4.5 Inverse Trigonometry & Applications

Integrated skills check

Skills-check directions

Show enough work to prove you are ready for the quiz. Every problem must include a labeled sketch or diagram.

Skills check A

Use inverse cosine to find an angle if the adjacent side is 8 and the hypotenuse is 10.

Student drawing / setup / work:

Skills check B

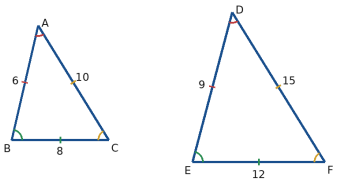
The angle of elevation to the top of a tower is 32° from a point 40 m away. Find the tower height.

Student drawing / setup / work:

Quiz 1 Review — Lessons 4.1 to 4.3

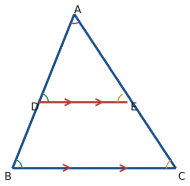
Use these image anchors to remind yourself what each type of diagram should look like.

Similar triangles: clearly mark corresponding parts



Angle colors match corresponding vertices.
Tick marks and side ratios show: AB↔DE, BC↔EF, AC↔DF.
Scale factor (small → large) = 3/2.

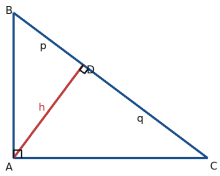
Parallel segment inside a triangle



Given: DE ∥ BC

Draw ABC first.
Add DE parallel to BC.
Mark equal angles to justify ΔADE ~ ΔABC.
Label split sides before writing a proportion.

Altitude to the hypotenuse creates 3 similar triangles



Draw order:

1. Draw one large right triangle.
2. Drop altitude h to the hypotenuse
3. Mark right angles at A and D.
4. Use p, q, and h or a side table.
5. Then write equations.

Readiness checklist

I can identify corresponding sides and angles.

I can write a valid proportion from similar triangles.

I can organize the 3 right triangles from an altitude to the hypotenuse.

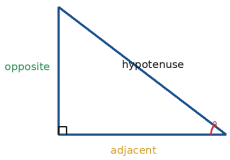
I can use a table or equation before solving.

My last-minute notes / examples

Quiz 2 Review — Lessons 4.4 to 4.5

Trig ratios, inverse trig, and applications

Label opposite, adjacent, and hypotenuse



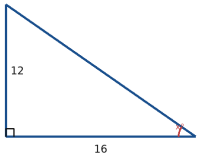
For the chosen angle θ:

SOH: sin θ = opposite / hypotenuse

CAH: cos θ = adjacent / hypotenuse

TOA: tan θ = opposite / adjacent

Use inverse trig to find an angle



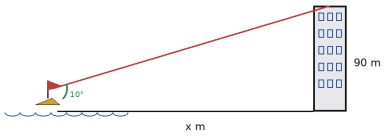
Example setup:

tan(x) = opposite / adjacent

tan(x) = 12 / 16

x = tan⁻¹(12/16) ≈ 36.9°

Angle of elevation application



Sketch directions:
1. Draw a horizontal ground or water line.
2. Draw a vertical building and label its height.
3. Connect the observer to the top of the building.
4. Mark the angle of elevation at the observer.

Readiness checklist

I can mark the reference angle.

I can label opposite, adjacent, and hypotenuse correctly.

I can choose sine, cosine, or tangent.

I can use inverse trig to find an angle.

I can turn a word problem into a right-triangle sketch.

My last-minute notes / examples

Performance Task — Community Observation Tower

Planning page

Task summary

Design a community observation tower. Create a scale drawing and use ideas from Unit 4 to justify at least three measurements. Your score depends on your labeled visual as well as your math.

Required visual features

- A scale side-view sketch of the tower
- At least one similar-figure or proportional reasoning setup
- At least one right-triangle trig setup
- Clear labels for all known lengths, unknown lengths, and angles

Planning sketch

Performance Task — Community Observation Tower

Work + reflection

Calculations

Show your proportion and/or trig calculations here. Be sure the math matches your drawing.

Reflection

How did your drawing help you solve the task? What was the hardest visual relationship to label correctly?

4.0A Congruence and Corresponding Parts

STRIDES notes — student fills in definitions and procedures

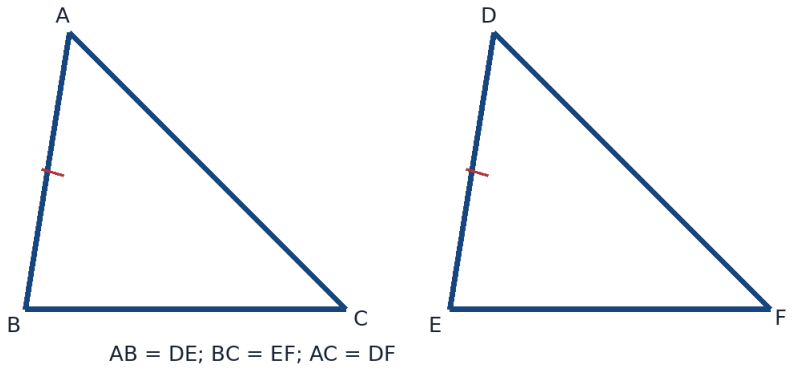
S - SUBJECT: Identify congruent segments, angles, circles, and polygons; solve equations from matching parts.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Congruence and Corresponding Parts



AB = DE; BC = EF; AC = DF

Drawing directions: Mark equal sides with identical tick marks and equal angles with identical arcs.

4.0A Congruence and Corresponding Parts

STRIDES example, steps, and guided practice

E - EXAMPLE: Triangles ABC and DEF correspond A↔D, B↔E, C↔F. AB=3x+2, DE=20. Find x.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: Congruent triangles have BC=2y+5 and EF=17. Solve for y.

Sketch / labels / calculations

4.0A Congruence and Corresponding Parts

Independent practice + integrated skill check

Independent practice 1: Triangles ABC and DEF correspond A↔D, B↔E, C↔F. AB=3x+2, DE=20. Find x.

Visual setup and solution

SKILLS CHECK: Congruent triangles have BC=2y+5 and EF=17. Solve for y.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.0B Isometries and Similarity Transformations

STRIDES notes — student fills in definitions and procedures

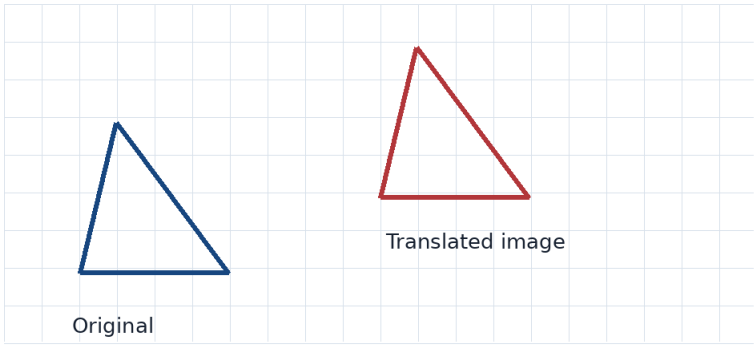
S - SUBJECT: Identify translation, rotation, reflection, dilation, and congruence as scale factor 1.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Isometries and Similarity Transformations



Drawing directions: Sketch a triangle on a grid, move it by a translation, reflect it, then compare distances.

4.0B Isometries and Similarity Transformations

STRIDES example, steps, and guided practice

E - EXAMPLE: A point P(2,3) is translated 4 right and 2 down. Find P′.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: A triangle with side 5 is dilated by factor 3. What is the new length?

Sketch / labels / calculations

4.0B Isometries and Similarity Transformations

Independent practice + integrated skill check

Independent practice 1: A point P(2,3) is translated 4 right and 2 down. Find P′.

Visual setup and solution

SKILLS CHECK: A triangle with side 5 is dilated by factor 3. What is the new length?

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.0C Triangle Types and Isosceles Theorem

STRIDES notes — student fills in definitions and procedures

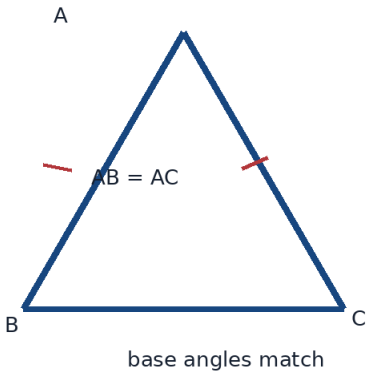
S - SUBJECT: Classify triangles; use equal sides to establish equal base angles and its converse.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Triangle Types and Isosceles Theorem



base angles match

Drawing directions: Draw an isosceles triangle; use matching ticks on legs and matching arcs on base angles.

4.0C Triangle Types and Isosceles Theorem

STRIDES example, steps, and guided practice

E - EXAMPLE: In isosceles triangle ABC, AB=AC and ∠B=48°. Find ∠C and ∠A.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: If two base angles equal 55°, find vertex angle and classify the triangle.

Sketch / labels / calculations

4.0C Triangle Types and Isosceles Theorem

Independent practice + integrated skill check

Independent practice 1: In isosceles triangle ABC, AB=AC and ∠B=48°. Find ∠C and ∠A.

Visual setup and solution

SKILLS CHECK: If two base angles equal 55°, find vertex angle and classify the triangle.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.0D Medians, Altitudes and Constructions

STRIDES notes — student fills in definitions and procedures

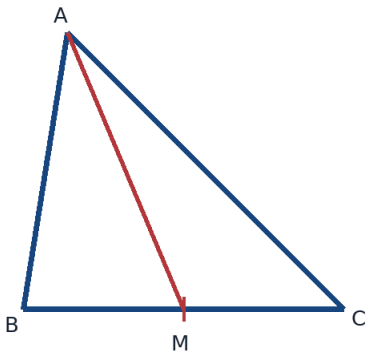
S - SUBJECT: Distinguish medians and perpendicular altitudes; construct regular polygons and symmetry axes.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Medians, Altitudes and Constructions



Median: vertex to midpoint

Altitude: perpendicular to side

Drawing directions: Draw a scalene triangle; midpoint tick marks identify a median, and a square marks an altitude.

4.0D Medians, Altitudes and Constructions

STRIDES example, steps, and guided practice

E - EXAMPLE: A triangle has a median from A to midpoint M of BC; BM=3x+1, MC=16. Find x.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: Can an altitude fall outside an obtuse triangle? Sketch and explain.

Sketch / labels / calculations

4.0D Medians, Altitudes and Constructions

Independent practice + integrated skill check

Independent practice 1: A triangle has a median from A to midpoint M of BC; BM=3x+1, MC=16. Find x.

Visual setup and solution

SKILLS CHECK: Can an altitude fall outside an obtuse triangle? Sketch and explain.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.2X Side Splitting Theorem and Converse

STRIDES notes — student fills in definitions and procedures

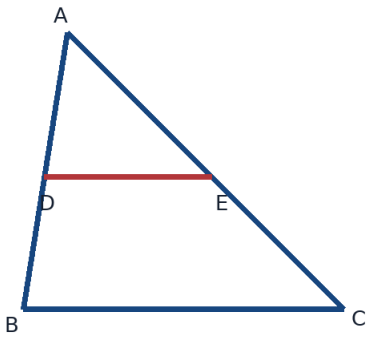
S - SUBJECT: Apply and justify proportional segments when a line is parallel to a triangle side.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Side Splitting Theorem and Converse



DE is parallel to BC

AD / DB = AE / EC

Drawing directions: Draw ABC with D on AB and E on AC, and DE parallel to BC; label four side pieces.

4.2X Side Splitting Theorem and Converse

STRIDES example, steps, and guided practice

E - EXAMPLE: AD=6, DB=4, AE=9, EC=x, with DE ■ BC. Find x.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: If AD/DB=4/6 and AE/EC=8/12, must DE be parallel to BC?

Sketch / labels / calculations

4.2X Side Splitting Theorem and Converse

Independent practice + integrated skill check

Independent practice 1: AD=6, DB=4, AE=9, EC=x, with DE ■ BC. Find x.

Visual setup and solution

SKILLS CHECK: If AD/DB=4/6 and AE/EC=8/12, must DE be parallel to BC?

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.3X Right Triangle Similarity and Pythagorean Proof

STRIDES notes — student fills in definitions and procedures

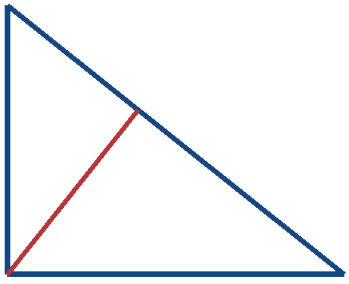
S - SUBJECT: Use altitude-to-hypotenuse similarity to establish $a^2+b^2=c^2$.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Right Triangle Similarity and Pythagorean Proof



Altitude splits c into p + q

$a^2 = c \cdot p$ and $b^2 = c \cdot q$

Add: $a^2+b^2 = c(p+q) = c^2$

Drawing directions: Draw a right triangle with altitude h to hypotenuse c, subdivided into p and q.

4.3X Right Triangle Similarity and Pythagorean Proof

STRIDES example, steps, and guided practice

E - EXAMPLE: A right triangle has legs 6 and 8. Find the hypotenuse using the theorem.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: Show how $a^2=cp$ and $b^2=cq$ imply $a^2+b^2=c^2$.

Sketch / labels / calculations

4.3X Right Triangle Similarity and Pythagorean Proof

Independent practice + integrated skill check

Independent practice 1: A right triangle has legs 6 and 8. Find the hypotenuse using the theorem.

Visual setup and solution

SKILLS CHECK: Show how $a^2=cp$ and $b^2=cq$ imply $a^2+b^2=c^2$.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.6A Pythagoras and Simplifying Radicals

STRIDES notes — student fills in definitions and procedures

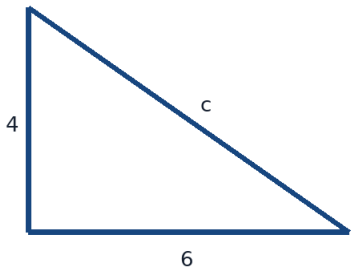
S - SUBJECT: Find missing right triangle sides and write irrational answers in simplest radical form.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Pythagoras and Simplifying Radicals



$c^2 = 4^2 + 6^2$

$c = \sqrt{52} = 2\sqrt{13}$

Drawing directions: Draw a right triangle, label the two legs and hypotenuse; square each known length.

4.6A Pythagoras and Simplifying Radicals

STRIDES example, steps, and guided practice

E - EXAMPLE: Legs are 4 and 6. Find exact hypotenuse length in simplest radical form.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: Hypotenuse 13, one leg 5. Find the other leg.

Sketch / labels / calculations

4.6A Pythagoras and Simplifying Radicals

Independent practice + integrated skill check

Independent practice 1: Legs are 4 and 6. Find exact hypotenuse length in simplest radical form.

Visual setup and solution

SKILLS CHECK: Hypotenuse 13, one leg 5. Find the other leg.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.6B Special Right Triangles

STRIDES notes — student fills in definitions and procedures

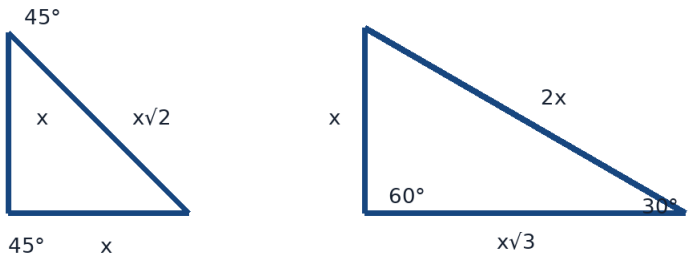
S - SUBJECT: Apply the 45–45–90 ratio 1:1:√2 and the 30–60–90 ratio 1:√3:2.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Special Right Triangles



Drawing directions: Draw both triangles and label all angles and corresponding side ratios.

4.6B Special Right Triangles

STRIDES example, steps, and guided practice

E - EXAMPLE: 45–45–90 triangle with leg 7. Find the hypotenuse.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: 30–60–90 triangle with short leg 5. Find long leg and hypotenuse.

Sketch / labels / calculations

4.6B Special Right Triangles

Independent practice + integrated skill check

Independent practice 1: 45–45–90 triangle with leg 7. Find the hypotenuse.

Visual setup and solution

SKILLS CHECK: 30–60–90 triangle with short leg 5. Find long leg and hypotenuse.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

4.6C Polygon Proofs, Quadrilaterals and Area

STRIDES notes — student fills in definitions and procedures

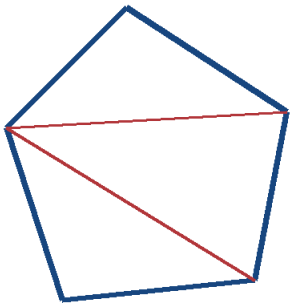
S - SUBJECT: Connect polygon angles, diagonal proofs, special quadrilaterals, and area decompositions.

T - TERMS / DEFINITIONS (write your own definitions)

R - RULES (explain the rule in your own words)

I - ILLUSTRATIONS

Polygon Proofs, Quadrilaterals and Area



Pentagon: 3 triangles

Interior angle sum = 3 × 180°

Area: decompose into simple shapes

Drawing directions: Draw a convex pentagon and 3 triangles from one vertex; draw trapezoid height and bases.

4.6C Polygon Proofs, Quadrilaterals and Area

STRIDES example, steps, and guided practice

E - EXAMPLE: Find the interior angle sum of a convex hexagon.

Sketch, mark, write the rule and solve

S - STEPS: Describe the procedure, then compare with the teacher model.

GUIDED: A trapezoid has bases 8 and 14 and height 5. Find area.

Sketch / labels / calculations

4.6C Polygon Proofs, Quadrilaterals and Area

Independent practice + integrated skill check

Independent practice 1: Find the interior angle sum of a convex hexagon.

Visual setup and solution

SKILLS CHECK: A trapezoid has bases 8 and 14 and height 5. Find area.

Required: labeled diagram, rule, equation and final answer

Teacher readiness: ■ Diagram correct ■ Rule stated ■ Work shown ■ Result checked

CUMULATIVE Unit 4 Standards Review

Additional standards check • include diagram for every response

1. [4.0A] Congruent triangles have BC=2y+5 and EF=17. Solve for y.

Sketch / reasoning

2. [4.0B] A triangle with side 5 is dilated by factor 3. What is the new length?

Sketch / reasoning

3. [4.0C] If two base angles equal 55°, find vertex angle and classify the triangle.

Sketch / reasoning

4. [4.0D] Can an altitude fall outside an obtuse triangle? Sketch and explain.

Sketch / reasoning

5. [4.2X] If AD/DB=4/6 and AE/EC=8/12, must DE be parallel to BC?

Sketch / reasoning

CUMULATIVE Unit 4 Standards Review

Special triangles, Pythagoras and polygon connections

6. [4.3X] Show how $a^2=cp$ and $b^2=cq$ imply $a^2+b^2=c^2$.

Sketch / reasoning

7. [4.6A] Hypotenuse 13, one leg 5. Find the other leg.

Sketch / reasoning

8. [4.6B] 30–60–90 triangle with short leg 5. Find long leg and hypotenuse.

Sketch / reasoning

9. [4.6C] A trapezoid has bases 8 and 14 and height 5. Find area.

Sketch / reasoning