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Unit 7.7, Lesson 1: Notes Name Ronda

My Notes

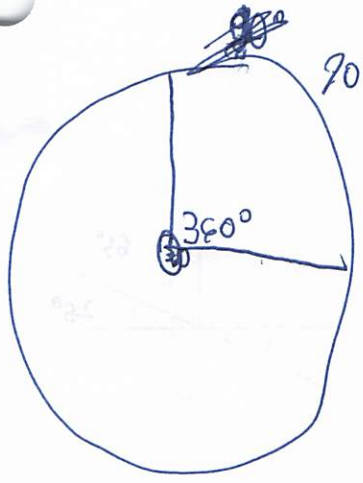
If the angle evenly goes into 360, there is no gap.

ex.

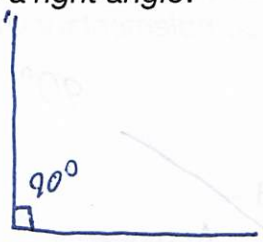
$\frac{360}{40} = 9$ → no gap

decimal = gap

$\frac{360}{50} = 7.1$

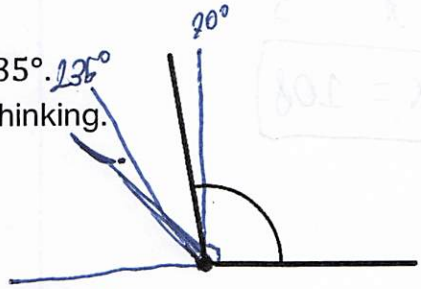


1.1 Draw a *right angle*.



1.2 Draw a *straight angle*.

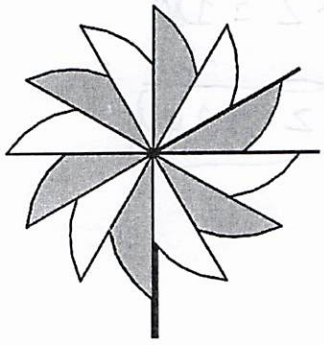
2. Daniela thinks this angle is 135°. Do you agree? Explain your thinking.



No, because 135 would be halfway between 90 and 180 but this angle is smaller than that.

3.1 Here is Kadeem's pinwheel design. What angle did he use?

$\frac{360}{12} = 30°$



3.2 Explain your strategy for calculating Kadeem's angle.

You know a circle has 360 degrees and there are 12 sections & divide to get the angle.

Summary

- Circle has 360°
- There will be a gap if the angle doesn't goes in 360°

☑ I can figure out angle measures around a vertex.

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Unit 7.7, Lesson 2: Notes

Name _____

My Notes

$3x + 36 = 360$

$-36 \quad -36$

$\frac{3x}{3} = \frac{324}{3} = 108$

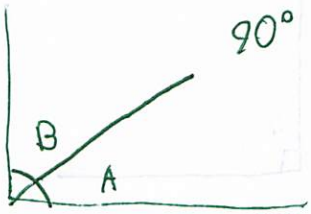
$x = 108$

$36 + z = 180$

$-36 \quad -36$

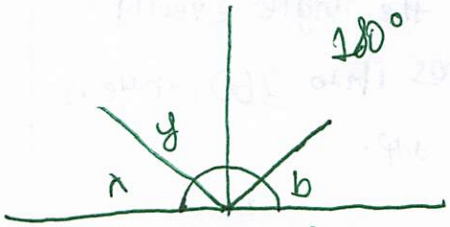
$z = 144$

1.1 Draw an example of *complementary angles*.



$A + B = 90°$

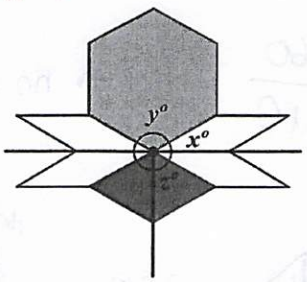
1.2 Draw an example of *supplementary angles*.



$x + y + b = 180$

2.1 Select **all** of the true equations.

- ☐ $x + y = 180$
- ☑ $x + z = 90$
- ☑ $2x + y = 180$
- ☑ $2x + 2z = 180$
- ☐ $x + y + z = 180$



2.2 Choose one equation that is **not true.** Explain why it is not true.

$x + y = 180$

They don't form a straight line.

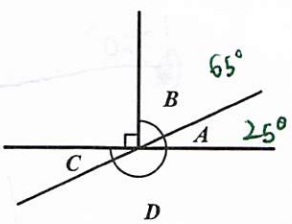
3. Angle $A = 25°$. A and B are *complementary angles*.

What is the measure of angle B?

$25 + b = 90$

$-25 \quad +25$

$b = 65$



Summary

Complimentary = 90, Supplementary = 180

- ☑ I can describe what complementary and supplementary angles are.
- ☑ I can determine unknown angles using what I know about complementary and supplementary angles.
- ☑ I can connect an angle diagram with an equation that represents it.

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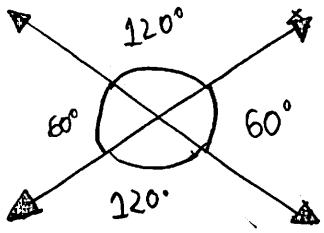
Unit 7.7, Lesson 3: Notes

Name Tshaan

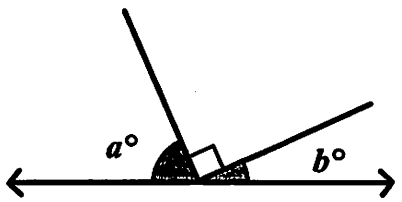
My Notes

1.1 Draw an example of *vertical angles*.



1.2 Label each angle with an estimate of its measure.

1.3 Explain why the shaded angles are not *vertical*.



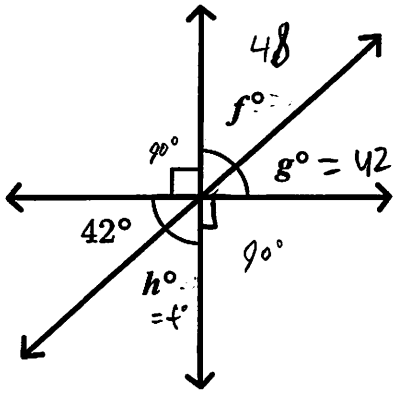
You need two intersecting lines but there are three

2.1 Determine the values of f, g, and h.

$42 + h = 180$

$-42 \quad -42$

$h = 48$



2.2 Explain how you figured out the value of angle f.

- Looked for vertical angles.
- Looked for complimentary angles.

Summary

Vertical angles are equal.

- [x] I can describe what vertical angles are.
- [x] I can write and use equations to determine unknown angles.

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Unit 7.7, Lesson 4: Notes

Name _____

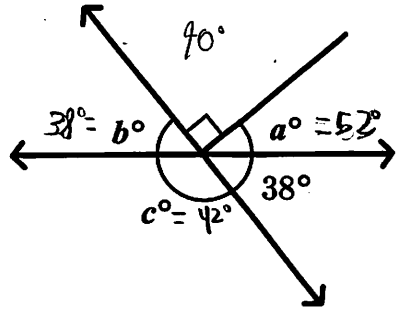
My Notes

- Supplementary add up to 180°.
- Complimentary add up to 90°.
- Vertical angles are equal.
- A circle has 360°.

1.1 Determine the values of a, b, and c.

$c + 38 = 180$
$-38 \quad -38$
$c = 142$

$a + 38 = 90$
$-38 \quad -38$
$a = 52$



1.2 Which missing value did you figure out first?

$b = 38$

What angle relationship did you use?

Vertical Angle

1.3 Write at least two true equations based on this diagram.

$b + a + 90 = 180$

$d + b = 90$

$c + b = 180$

1.4 Write one equation that is **not** true based on this diagram. Explain how you know the equation is not true.

$d + b = 180$

$52 + 38 = 90$ not 180

Summary

(None, there no summary.)

☑ I can solve multistep problems using what I know about complementary, supplementary, and vertical angles.

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Unit 7.7, Lesson 4: Missing Measures Name _____

Activity 1: Solving Challenges

For this activity, you need challenge cards and a partner.

Circle one: I am partner (A) / B.

Challenge 1

Based on the diagram:

1. Estimate each measure.

   $a = 66$ $b = 24$

2. Write at least one true equation.

   $a + b = 90$

3. Ask your partner for the missing measure.

   Then determine every other measure.

Challenge 2

Based on the diagram:

1. Estimate each measure.

   $a = 65$, $b = 25$

2. Write at least one true equation.

   $a + b + 90 = 180$

3. Ask your partner for the missing measure.

   Then determine every other measure.

Challenge 3

Based on the diagram:

1. Estimate each measure.

   $a = 22$, $b = 114$, $c = 66$

2. Write at least one true equation.

3. Ask your partner for the missing measure.

   Then determine every other measure.

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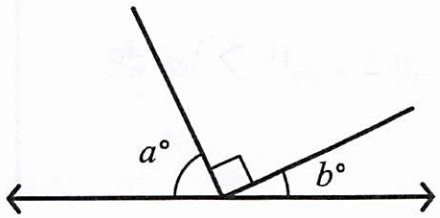
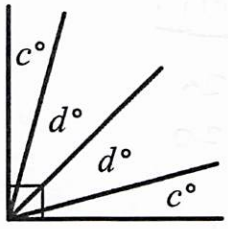
Unit 7.7, Lesson 4: Missing Measures Name _____

Lesson Synthesis

What advice would you give to someone determining missing angle measures in a diagram?

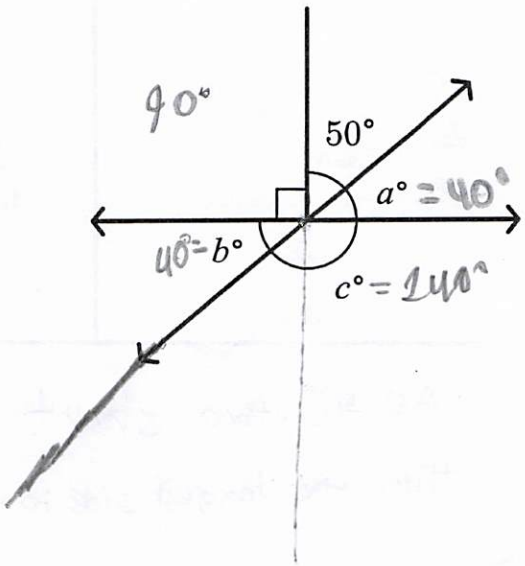
Use the examples on the right if they help you with your explanation.





Cool-Down

1. Write at least one true equation based on this diagram.



2. Determine the values of a, b, and c.

$b + c = 180$ $140 + d = 140$

-45 -45 -140 -140

$c = 135$ $d = 40$

$b = 45$

Excellent!

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Unit 7.7, Lesson 5: Notes

Name _____

My Notes

small + small > large

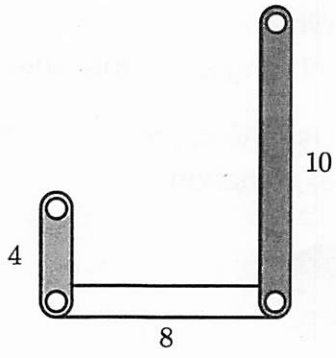
upper limit
(Add sides)
7 + 13 = 20
side length < 20

Lower limit
subtract them
13 − 7 = 4
4 < side length

1. Will these side lengths form a triangle? Explain your thinking.

12 > 10 ✓

Yes, because the sum of the two shorter sides is larger than long side.

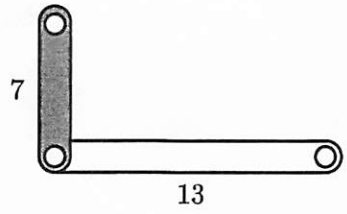


2.1 What is one possible third length that would form a triangle?

4 < side length < 20

Explain how you know.

15 because it's less than 20 and greater than 4.



2.2 What is a length that would be too long? Too short?

Too long: 25 Too short: 1

Explain one of your answers.

1 would be too short for the arms to reach each other.

Summary

Add the two short sides and make sure they are greater than the longest side to form a triangle.

☑ I can decide whether or not three side lengths will make a triangle.

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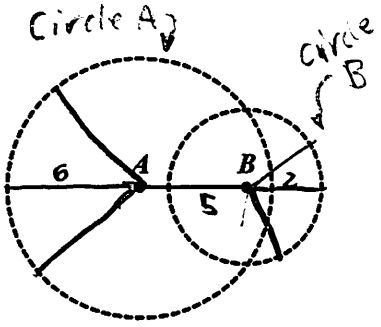
Unit 7.7, Lesson 6: Notes Name _____

My Notes

Amanda began to draw a triangle with side lengths 5, 2, and 6 units.



1.1 What does each circle in Amanda's drawing represent?

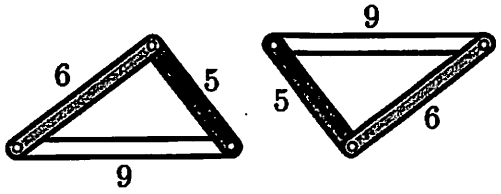
- Circle A is all the points 6 units away from point A.
- Circle B is all the points 2 units away from point B.

1.2 Explain or show how she can complete the triangle.

Connect the ends of the triangle where the circles intersect.

2. Emika built two triangles with side lengths 5, 6, and 9 units. Explain how you know these two triangles are *identical copies*.

Since the sides lengths are the same, they can only form the same triangle its just rotated.



How many nonidentical triangles can be made using these lengths:

3.1 4.5, 8, and 10 units

$4.5 + 8 > 10$

$12.5 > 10$ ✓

form one triangle

3.2 9, 11, and 21 units

$9 + 11 > 21$

$20 > 21$ ✗

form none(0) triangles.

There can only be 0 or 1 shape(s) with 3 sides

Summary

Small + small > large to be a triangle

- [x] I can explain what it means for shapes to be identical copies.
- [x] I can determine whether you can make zero, one, or more than one shape given a set of side lengths.

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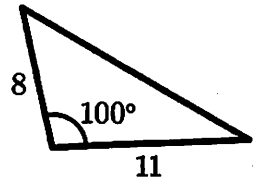
Unit 7.7, Lesson 7: Notes Name _____

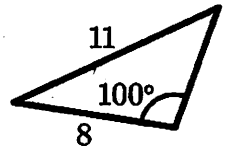
My Notes

1. Which of the triangles below are identical?

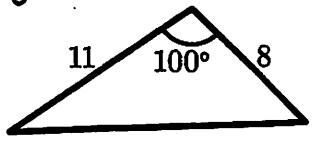
A



B



C



Explain your thinking.

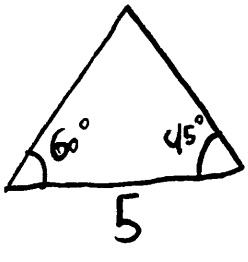
100° is labeled between the sides 8 and 11.

2.1 Mariana and Jamir are both drawing triangles that have a 5 cm side, a 60° angle, and a 45° angle. Will Mariana's and Jamir's triangles be identical?

Show or explain your thinking.

Maybe. It depends on where they put the angles and the 5 cm side.

(Not drawn to scale)



2.2 What information would Jamir need about Mariana's triangle in order to be sure she was creating an identical triangle?

You need the specific location of where the sides and angles go in relation to each other.

Summary

- If you have 3 side lengths you can make 0 or 1 triangle(s).
- If you have a combination of angles and side lengths, you can make more than one triangle.

- [x] I can build triangles given three measurements.
- [x] I can explain why there is sometimes more than one possible triangle given three measurements.

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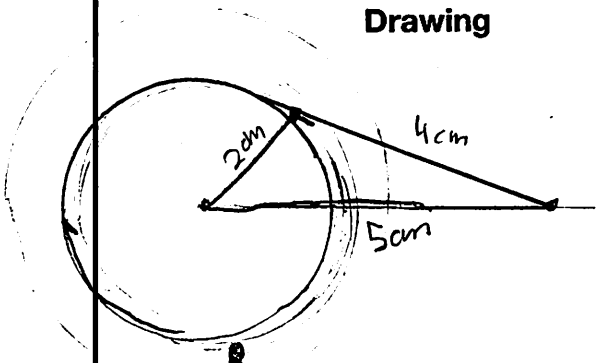
Unit 7.7, Lesson 8: Notes Name _____

My Notes

Draw a triangle using each set of measurements. Explain your steps.

1.1 Side lengths 2 cm, 4 cm, and 5 cm.

Drawing

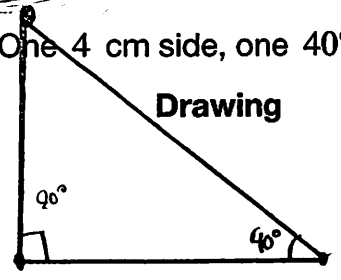


My Steps

① Draw a 5cm line
② Draw a circle with a radius of 2cm
③ Draw a 4cm line that connects the endpoint and circle.

1.2 One 4 cm side, one 40° angle, and one 90° angle.

Drawing



4 cm

My Steps

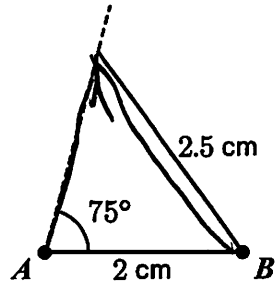
① Draw a 4cm line
② Draw a 40° angle off one endpoint
③ Draw a 90° angle off the other endpoint.

2. Here are the steps Axel took to draw this triangle:

Step 1: Draw a 2 cm line.

Step 2: Draw a 75° angle at point A.

Step 3: Draw a 2.5 cm line from point B to the dotted line.



Draw a different triangle with the same three measurements.

Draw the 2.5cm line of the 75° angle

Summary

There is 180° in a triangle.

☑ I can use a ruler and a protractor to draw triangles that match a description.

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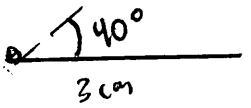
Unit 7.7, Lesson 8: Can You Draw It? Name _____

Warm-Up



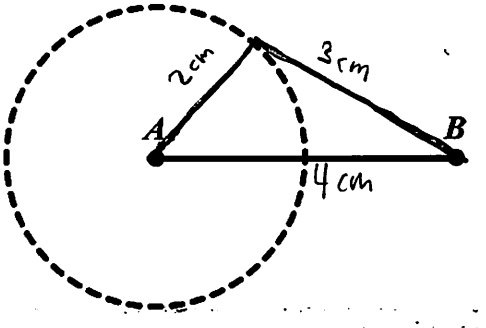
Activity 1: Complete the Triangles

Three students are drawing triangles based on these descriptions:

Description #1	Description #2	Description #3
A triangle with sides that are 3 cm, 2 cm, and 4 cm.	A triangle with one 3 cm side, one 4 cm side, and one 60° angle.	A triangle with one 45° angle, one 75° angle, and one 3 cm side.

1. Sadia is working on Description #1. Here are the steps she took so far.

   - Step 1: Draw a 4 cm line segment AB.
   - Step 2: Use a compass to draw a circle around point A with radius 2 cm.



Describe or show how Sadia can finish drawing a triangle that fits Description #1.

- Draw another circle with a radius of 3cm. Add another point where the circles intersect.
- Draw a 3cm line that intersects B and the circle.

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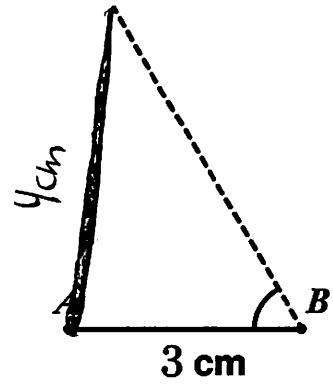
Unit 7.7, Lesson 8: Can You Draw It? Name _____

2. Nekeisha is working on Description #2.
Here are the steps she took so far.

- Step 1: Draw a 3 cm line segment.
- Step 2: Use a protractor to draw a 60° angle at the end of the segment.



Describe or show how Nekeisha can finish her drawing.

Draw

• Draw a 4cm line that intersects A and the dotted line

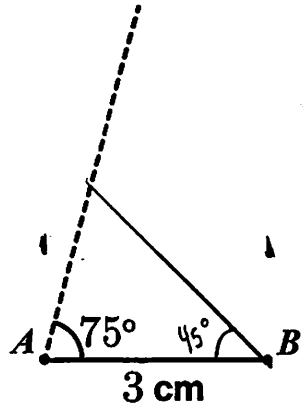
3.1 Ahmed is working on Description #3.
Here are the steps he took so far.

- Step 1: Draw a 3 cm line segment.
- Step 2: Use a protractor to draw a 75° angle.

45°

Describe or show how Ahmed can finish his drawing.

Draw a 45° angle starting at point B and connect it to the dotted line,



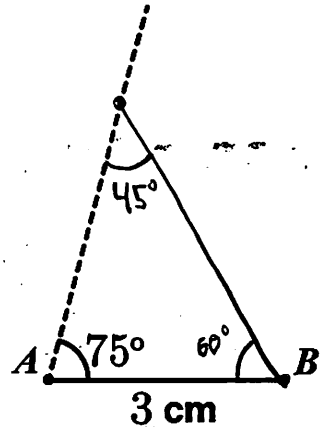
3.2 Is it possible for Ahmed to draw a different triangle that matches this description?

Use the diagram on the right to show or explain your reasoning.

$180-(75+45)=60$

$180-120=60$

$60=60$ ✓



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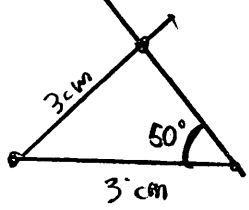
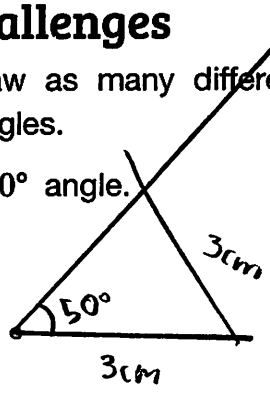
Unit 7.7, Lesson 8: Can You Draw It? Name _____

Activity 2: Drawing Challenges

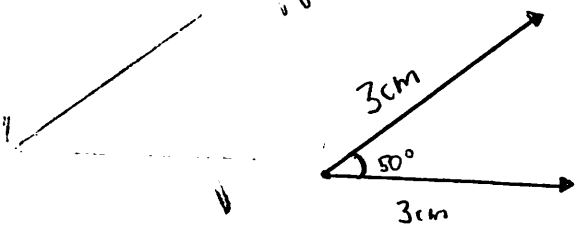
For each description below, draw as many different triangles as you can. Then trade with a classmate and compare your triangles.

1. Two 3 cm sides and one 50° angle.

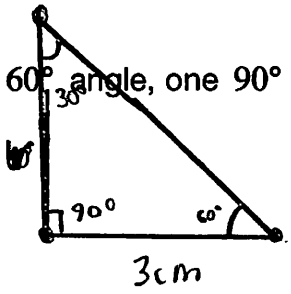




2. Two 3 cm sides with a 50° angle in between.



3. One 60° angle, one 90° angle, and one 3 cm side.



4. Two 90° angles and one 3 cm side. How would? it look

$180-(90+90)=0$ → It's impossible.

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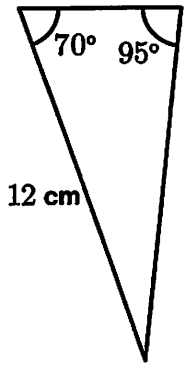
Unit 7.7, Lesson 8: Can You Draw It? Name _____

Lesson Synthesis

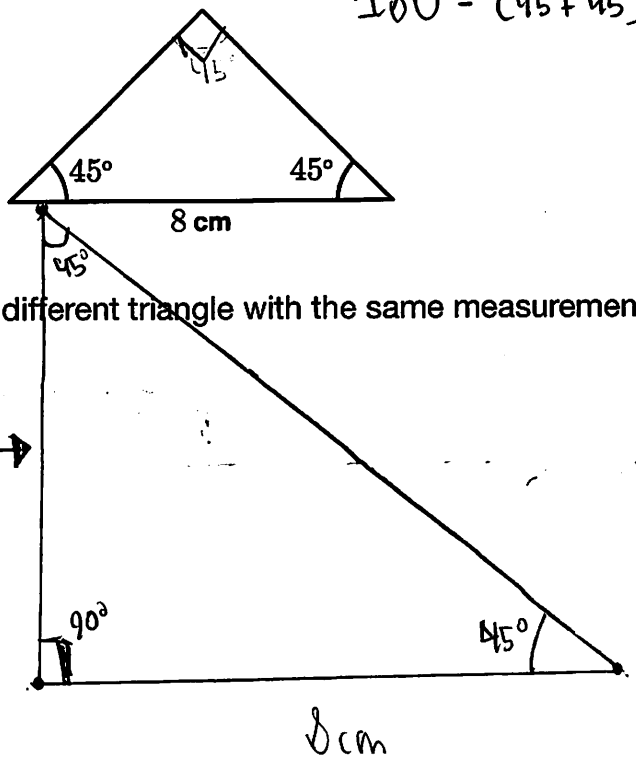
Describe how you can draw two different triangles given one side length and two angle measures.



① start by drawing the side length.
② Draw an angle off both ends to create the first triangle
③ For the second triangle, calculate the missing angle then use that and one of the given angles and draw those off the side length.

Cool-Down

Alejandro was asked to draw a triangle with two 45° angles and a side length of 8 cm. He drew this:



Is it possible for Alejandro to draw a different triangle with the same measurements?

Show or explain your reasoning.

Yes, it's shown here →

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Unit 7.7, Lesson 9: Notes

Name I Shaan

My Notes

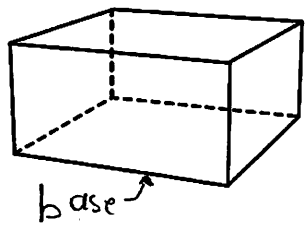
1. Explain in your own words what a *cross section* is.

It's a slice through a 3d shape that makes some sort of 2D shape

Here is a rectangular prism.

2. Select **all** the possible cross sections of this prism.

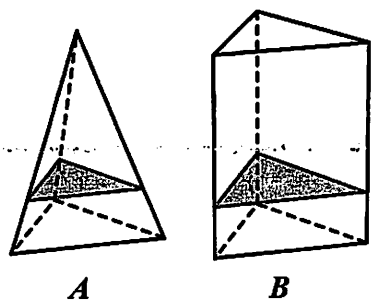
- [x] Triangle
- [x] Rectangle
- [x] Pentagon
- [ ] Hexagon
- [ ] Octagon



Here is a triangular pyramid and a triangular prism.

3.1 If you cut both the pyramid and the prism parallel to their bases, how would the cross sections be **similar**?

shape of cross section is the same as the base



When cross section is parallel to base;

- Shape of cross section
- Compare areas of cross section to base;

3.2 How would they be **different**?

- The area of the cross selection of the pyramid (at) is smaller than the base.
- The area of the cross section of the prism (B) is the same as the base.

Summary

- [x] I can describe cross sections of a solid.
- [ ] I can compare and contrast cross sections of prisms and pyramids.

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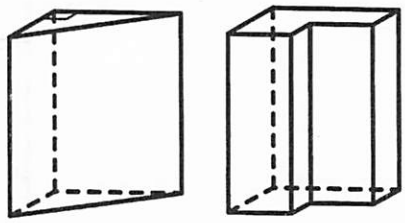
Unit 7.7, Lesson 10: Notes Name _____

My Notes

1. Describe a strategy for calculating the volume of a prism.

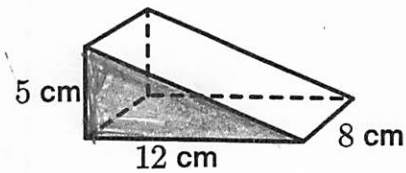
V = Base Area • Height



Prism → has rectangular sides (not the base)

2.1 Shade in a base of this prism.

2.2 Calculate the volume. Show all of your calculations.



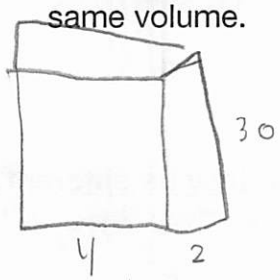
V = Base Area • Height

$= (\frac{1}{2} \cdot 12 \cdot 5) \cdot 8$

$= 30 \cdot 8$

$= 240\ cm^3$

2.3 Sketch and label a **rectangular** prism with the same volume.



$V = BA \cdot H$

$= (2 \cdot 4) \cdot 30$

$= 8 \cdot 30$

$= 240\ cm^3$

Summary

$V = BA \cdot H$

- [x] I can explain how the volume of a prism is related to the area of its base and its height.
- [x] I can calculate the volume of rectangular and triangular prisms.

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Unit 7.7, Lesson 11: Notes

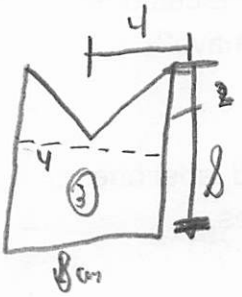
Name Ishaan

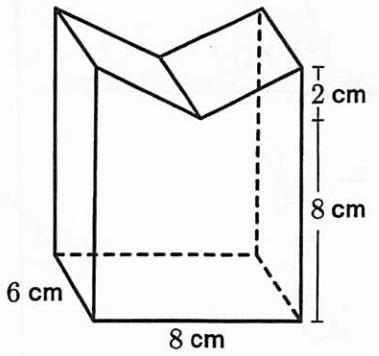
My Notes

The base is the non-rectangular side

$A_{\Delta} = \frac{1}{2} b \cdot h$

1.1 Sketch the base of this prism and label its dimensions.





1.2 What is the area of the base? Explain or show your reasoning.

① $\frac{1}{2} \cdot 4 \cdot 2 = 4$

② 4

③ $8 \cdot 8 = 64$

$A_{base} = 72\ cm^2$

1.3 What is the volume of the prism?

$V = 72 \cdot 6,\ V = 432$

2. Use any strategy to calculate the volume of this prism. Show all of your thinking.

① $5 \cdot 3 = 15$

② $\frac{1}{2} \cdot 3 \cdot 4 = 6$

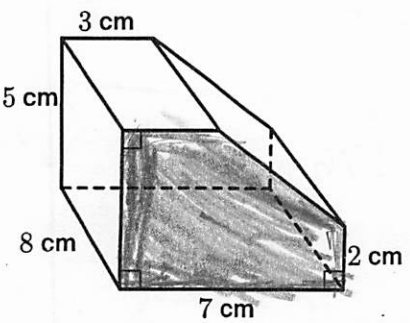
③ $4 \cdot 2 = 8$

$= 29$

$BA = 29$

$H = 8$

$V = 29 \cdot 8 = 232\ cm^3$



Summary

☑ I can calculate the volume of more complicated prisms.

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Unit 7.7, Lesson 12: Notes

Name _____

My Notes

Area

= 18

+

= 18

+

5 = 35

+

4 = 28

7

+

3 = 21

7

+

= 56

7

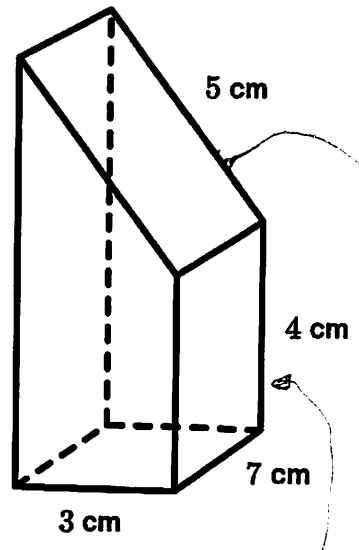
176 cm²

Here is a prism.

1.1 How many faces does this prism have?

6

1.2 Sketch and label one of the bases.



1.3 Calculate the surface area of your prism.

A2D = 2·18 = 36

1.4 Explain a strategy for calculating the surface area of this prism.

Find the area of all sides and add them up.

Summary

- ☐ I can calculate the surface area of a prism.
- ☐ I can compare and contrast different strategies for calculating surface area.

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Unit 7.7 Lesson 12: Surface Area Strategies Name _____

Warm-Up

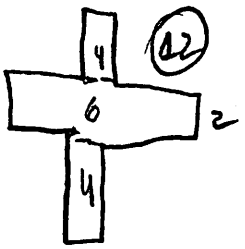
14 faces

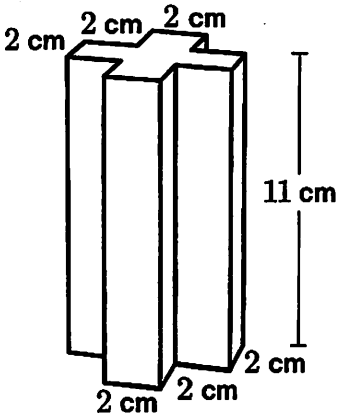
12 ▯ = 12 · 2 · 11 = 264

2 ✚ = 2 · 20 = 40

+

304 cm^2





Activity 1: Different Strategies

Three students are trying to calculate the *surface area* of this prism.

Amoli says:

We have to draw each of the 14 different faces, find their areas, and add those up.

Pro what?!

NO

Nyanna says:

There are only two different shapes: the plus sign and the rectangle. We can find the area of each shape and use a calculator to multiply by the number there are of each shape.

Yes (see above)

Miko says:

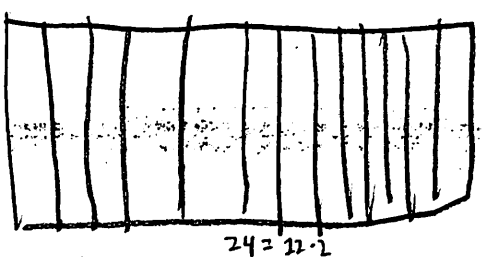
I see another way! Imagine unfolding the prism into a net. We can use one large rectangle instead of 12 smaller ones.

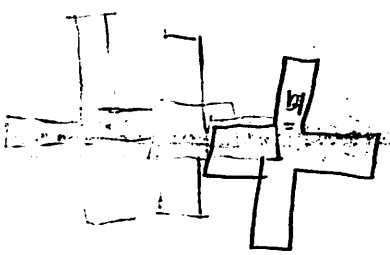
Yes (see below)

1. Who do you agree with? Explain your reasoning.

Nyanna → easier

2. Sketch the "one large rectangle" Miko is talking about.
   What are the dimensions of this rectangle? Explain or show your reasoning.





3. Use any strategy to calculate the surface area of this solid. Organize your thinking and calculations so others can follow them.

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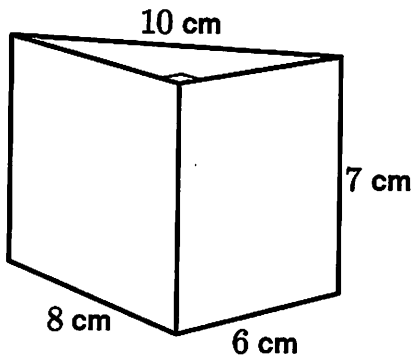
Unit 7.7 Lesson 12: Surface Area Strategies Name _____

Activity 2: Calculating Surface Area

For each prism:

- Determine how many faces the prism has.
- Use any method to calculate the surface area. Show your thinking.
- Trade papers with your partner. Work together to reach an agreement about the surface area.

1.



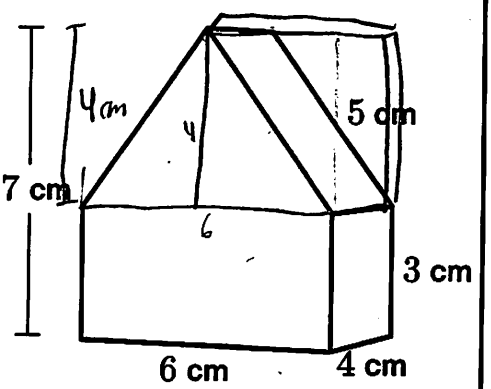
Number of faces: 5

Surface area: 216 cm²

My work:

7·6 = 42
8·7 = 56
10·7 = 70
6·8 = 48
216 cm²

2.



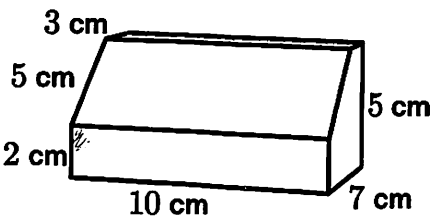
Number of faces: 8

Surface area: 148 cm²

My work:

2·30 = 60
2(3·4) = 24
2(5·4) = 40
6·4 = 24
148 cm²

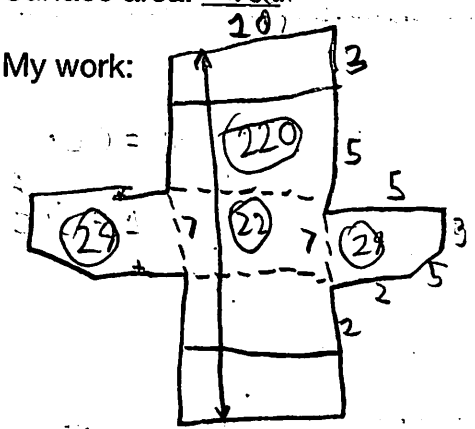
3.



Number of faces: 7

Surface area: 278 cm²

My work:



4. Whose strategy is most similar to yours? Whose strategy is your partner's thinking most like?

Are You Ready for More?

On a separate piece of paper, design a prism with a surface area of 200 square units.

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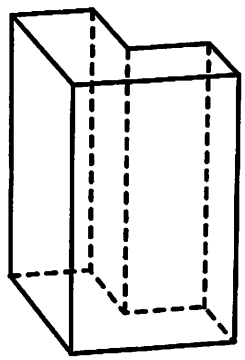
Unit 7.7 Lesson 12: Surface Area Strategies Name _____

Lesson Synthesis

Describe your favorite method for calculating the surface area of a prism.
Use the prism on the right if it helps you with your explanation.



Cool-Down

Calculate the surface area of this prism. Organize your thinking and calculations so that others can follow them.

$2B = \frac{1}{2} \cdot 5 \cdot 12 = 60$

$8 = 12 \cdot 8 = 96$

$8 = 8 \cdot 5 = 48$

$= 13 \cdot 8 = 104$

308 cm^2

13 × 12 = 26, 130

13 × 8 = 104, × 2 = 208

156 + 208 = 364 cm²