MBF 3C Unit 1 – Mathematics Review Unit – Outline

Day	Lesson Title	Specific Expectations
1	General Review of Grades 7 - 10	Review Gr. 7 - 10
2	Review of Ratios	Review Gr. 7 - 10
3	Review of Solving Equations	Review Gr. 7 - 10
4	Review of Similar Triangles	Review Gr. 7 - 10
5	Evaluation Day	
TOTAL DAYS:		5

Unit 1: Day 1: Introduction to Grade 11

MBF3C

Materials
BLM1.1.1,
BLM1.1.2
BLM1.1.3

Description

This unit is designed to review the content from previous years.

Assessment Opportunities

Minds On ...

Pairs →Think/Pair
Students fill in the math they remember from previous grades on BLM1.1.1 ("Math I Know"). Allow 4 or 5 minutes individually, then an additional 5 minutes in pairs.

Action!

Individual → Practice
Students solve as many of the questions from BLM1.1.2 "Find Someone Who" as they can.

Whole Class →Exploration
Students circulate around the classroom, introduce themselves to others in the class at the same time finding students who can help them fill out the rest of their sheet. Students record persons name as well as the full solution to the question. Take up all questions on the overhead or board to be certain the correct answers are all found.

Consolidate Debrief

Small Groups →Extending
Students add to BLM1.1.1 "Math I Know" Worksheets.

Whole Class → Discussion
Students share their responses to BLM1.1.1.

Home Activity or Further Classroom Consolidation

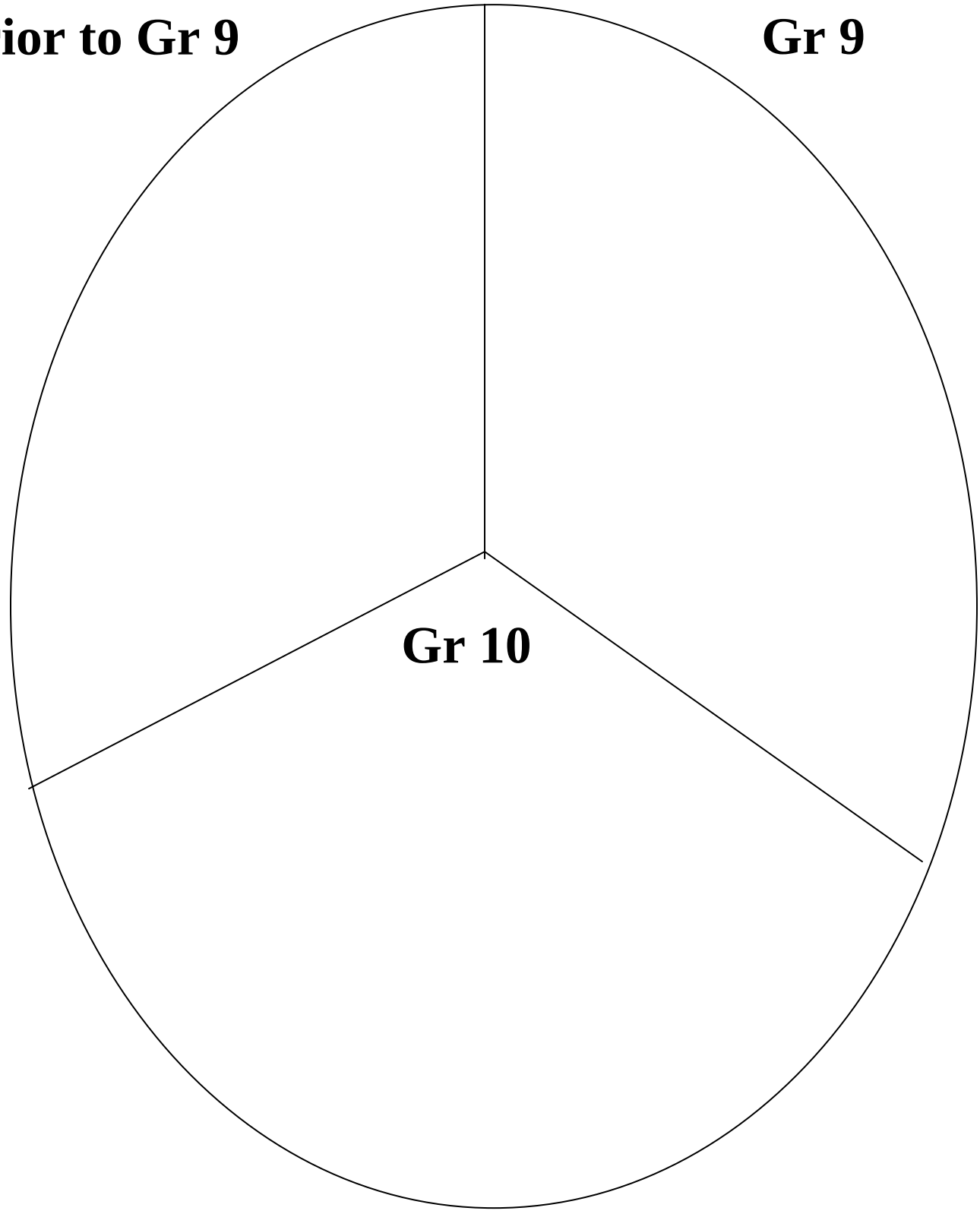
Application

Students complete BLM1.1.3.

MBF3C
BLM1.1.1

Name:
Date:

Math I Know!



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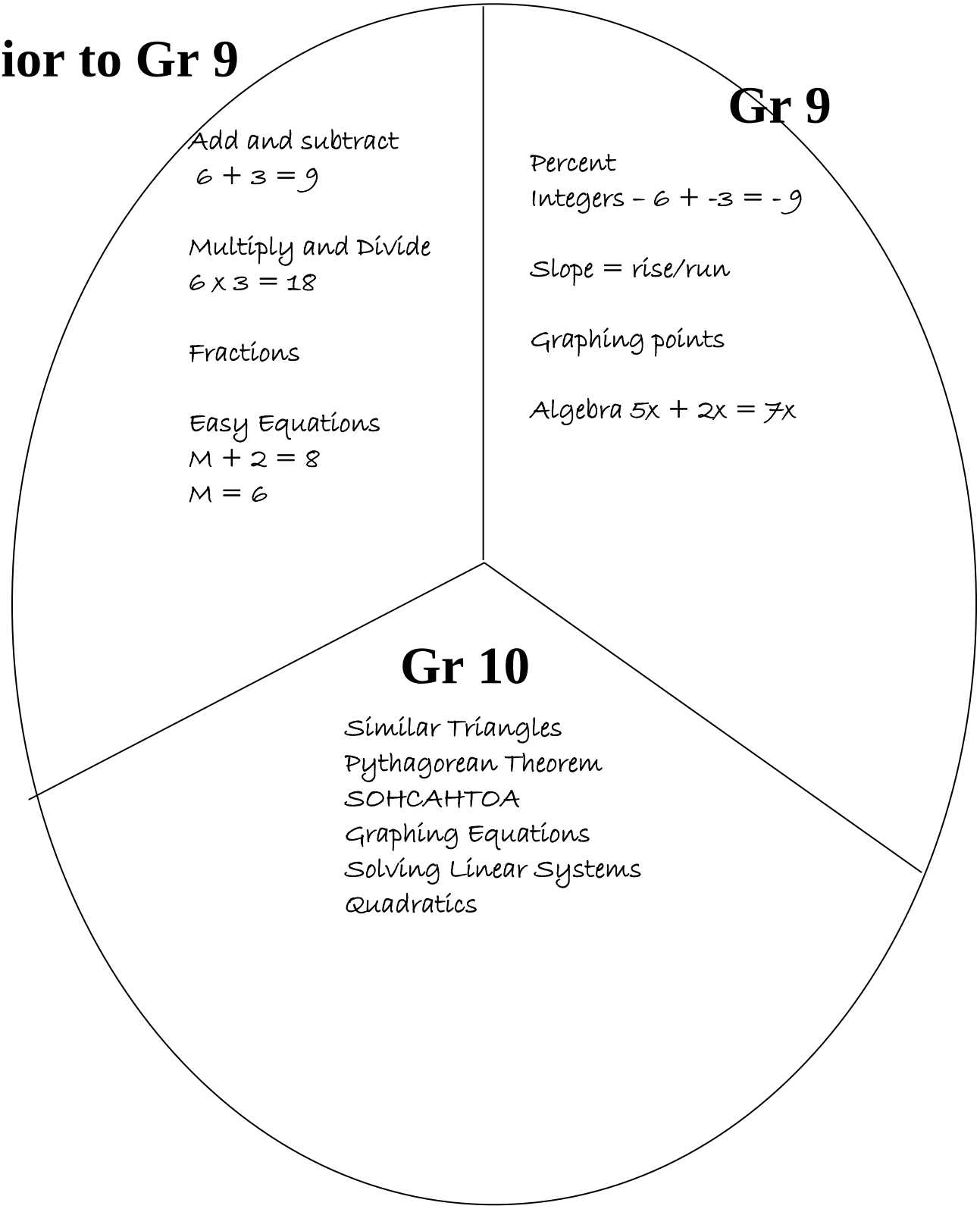
BLM1.1.1

Math I Know! (Teacher)



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BLM1.1.2

Find Someone Who ….

Name:
Date:

A kite is 10 m up in the sky. The angle the string makes with the ground is 50 degrees. How long is the kite string?
Name_____

Can Evaluate:
- 6 + - 3 = ____
2 – (-3) = ____
Name: _____

Can Evaluate:
6 x 3 = ____
9 x 9 = ____
Name: _____

Can solve for p:
P – 4 = 13

Name: _____

Can expand 3(x + 2)

Name_____

Can use the Pythagorean theorem to solve for b given c = 13 and a = 12

Name: _____

Can round to the nearest hundred
a) 459 = _____
b) 32926 = _____
Name _____

Can represent slope in two ways

Name_____

Can round to the nearest tenths
a) 7.22 = _____
b) 3.024 = ____
c) 2. 56 = _____
Name _____

Can solve: If you build a skateboard ramp whose ratio of height to base must be 2:3, what is the base if the height is 4.5 m?

Name _____

Can expand and simplify $(x + 1)(x – 1)$

Name_____

Can expand and simplify $(x + 1)^2$

Name _____

Can use the Pythagorean theorem to solve for c given a=3 and b=4

Name _____

Can Divide:
100 by 10 = ____
144 by 12 = ____
Name: _____

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BLM1.1.2

Find Someone Who ….(Teacher)

A kite is 10 m up in the sky. The angle the string makes with the ground is 50 degrees. How long is the kite string?

SIN50 = $\frac{10}{H}$, H = 57.59m

Can Evaluate:
- 6 + - 3 = __- 9 __
2 – (-3) = _ 5__
Name: _____

Can solve for p:
P – 4 = 13
P -4 + 4 = 13 + 4
P = 17

Can Evaluate:
6 x 3 = __18_
9 x 9 = _81___
Name: _____

Can expand 3(x + 2)
3x + 6

Can use the Pythagorean theorem to solve for b given c = 13 and a = 12
$B^2 = 13^2 – 12^2$
$B^2 = 169 – 144$
$B^2 = 25$
B = 5

Can round to the nearest hundred
a) 459 = __500__
b) 32926 = __33000_
Name _____

Can represent slope in two ways
Slope = rise div by run or slope is m in y = mx + b

Can round to the nearest tenths
a) 7.22 = __7.2__
b) 3.024 = _3.0___
c) 2. 56 = ___2.6_
Name _____

Can solve: If you build a skateboard ramp whose ratio of height to base must be 2:3, what is the base if the height is 4.5 m?
2/3 = 4.5/x
2x = 13.5
x = 6.75
Name _____

Can expand and simplify
(x + 1)(x – 1)
$= x^2 – 1x + 1x – 1$
$= x^2 - 1$

Name_____

Can expand and simplify $(x + 1)^2$
$= (x + 1)(x + 1)$
$= x^2 + 1x + 1x + 1$
$= x^2 + 2x + 1$
Name _____

Can use the Pythagorean theorem to solve for c given a=3 and b=4

C = 5
Name _____

Can Divide:
100 by 10 = _10__
144 by 12 = __12_
Name: _____

Name:
Date:

MBF3C
BLM1.1.3

Math MATCHING

Match the letter from Column B with the most appropriate number in Column A.
Be certain to **show ALL work**

	Column A	Column B
_____ 1.	Expand and simplify $2(x + 3)$	A. 24.4 m
_____ 2.	Use the Pythagorean Theorem to solve for c given a = 8 and b = 6	B. 15.56 m
_____ 3.	Expand and simplify $(x + 3)(x + 2)$	C. $2x + 6$
_____ 4.	Use the Pythagorean Theorem to solve for c given a = 20m and b = 14m	D. 7.5 m
_____ 5.	If you build a skateboard ramp whose ratio of height to base must be 2:3, what is the base if the height is 5 m?	E. 17.68 m
_____ 6.	A kite is 15 m up in the sky. The angle the string makes with the ground is 50 degrees. How long is the kite string?	F. $x^2 + 5x + 6$
_____ 7.	A kite is 10 m up in the sky. The angle the string makes with the ground is 40 degrees. How long is the kite string?	G. 19.58 m
_____ 8.	Bob has a kite and his string is 25 m long. The angle the kite makes with the ground is 45 degrees. How far horizontally is the kite from Bob?	H. 10

MBF3C
BLM1.1.3

Name:
Date:

Math MATCHING

Match the letter from Column B with the most appropriate number in Column A.
Be certain to **show ALL work**

	Column A	Column B
_C_ 1.	Expand and simplify $2(x + 3)$	A. 24.4 m
_H_ 2.	Use the Pythagorean Theorem to solve for c given a = 8 and b = 6	B. 15.56 m
F _ 3.	Expand and simplify $(x + 3)(x + 2)$	C. $2x + 6$
A_ 4.	Use the Pythagorean Theorem to solve for c given a = 20m and b = 14m	D. 7.5 m
D_ 5.	If you build a skateboard ramp whose ratio of height to base must be 2:3, what is the base if the height is 5 m?	E. 17.68 m
G_ 6.	A kite is 15 m up in the sky. The angle the string makes with the ground is 50 degrees. How long is the kite string?	F. $x^2 + 5x + 6$
__ B_ 7.	A kite is 10 m up in the sky. The angle the string makes with the ground is 40 degrees. How long is the kite string?	G. 19.58 m
_ E_ 8.	Bob has a kite and his string is 25 m long. The angle the kite makes with the ground is 45 degrees. How far horizontally is the kite from Bob?	H. 10

Unit 1: Day 2: Ratio Review

MBF3C

Description

This lesson is designed to activate student's prior knowledge of ratio, rates and proportions.

Materials
Markers
Chart paper
Rulers
Imperial and metric measuring tape
Deck of cards
Calculator
BLM1.2.1

Assessment Opportunities

Minds On ...

Groups of 4 → Graffiti

Using 8 large pieces of chart paper write two of each of the headings– Ratio, Rate, Proportions, Similar Figures and post them around the room. Each group circulates through the four charts reflecting on their prior knowledge about the topic.

Whole Class → Discussion

Highlight key points from each of the charts. Clarify any misunderstandings or misrepresentations.

Action!

Groups of 4 → Carousel

Students rotate through the following four stations dealing with ratios.

Golden Ratio; Creating a Golden Ratio; Wrist to Thumb Ratio; Ratio War

Creating Golden Ratio Station: Students could use colour tiles (1"x1") Integer tiles or graph paper to create their rectangles

Consolidate Debrief

Whole Class → Discussion

Have students share their results for The Golden Ratio station (approx. 0.62) and the Golden Rectangle's station (approx. 1.62). Highlight that these are both Golden ratios and show that they are the reciprocal of the other.

Write some of the students' wrist to thumb ratios on the board. The circumference of the wrist in inches is approximately the same as the circumference of the thumb in centimeters. When students are expressing it as a ratio they need to be careful to not state it as a 1:1 ratio because the units for the ratio must be the same.

Home Activity or Further Classroom Consolidation

Students research an application of the Golden Ratio.

Application

Station: Golden Ratio

On the line segment AC, draw a point B such that the ratio of the short part of the segment AB to the long part BC equals the ratio of the long part BC to the entire segment AC. i.e. $\frac{AB}{BC} = \frac{BC}{AC}$

Calculate the value of the ratio as a decimal? _____

Record your various trials in the table below.

AB	BC	AC	$\frac{AB}{BC}$	$\frac{BC}{AC}$

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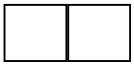
BLM1.2.1

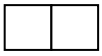
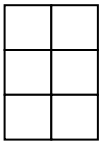
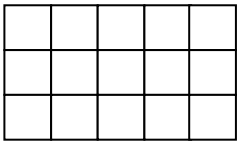
Station: Creating a Golden Rectangle

Create a square 1 inch x 1 inch. 

Add a square of the same size to form a new rectangle. 

Continue adding squares whose side lengths are the length of the longer side to form a new rectangle. (Repeat 5 times)

Complete the table below recording the lengths of the rectangle and calculate the value of the ratio of the longest side of the rectangle to the shortest side of the rectangle as a decimal.

Diagram	Length of the Longest Side of the Rectangle (L)	Length of the Shortest Side of the Rectangle (S)	L : S (as a decimal)
			
			
			
			

MBF3C
BLM1.2.1

Station: Wrist to Thumb Ratio

a) Measure the circumference of your wrist in inches.

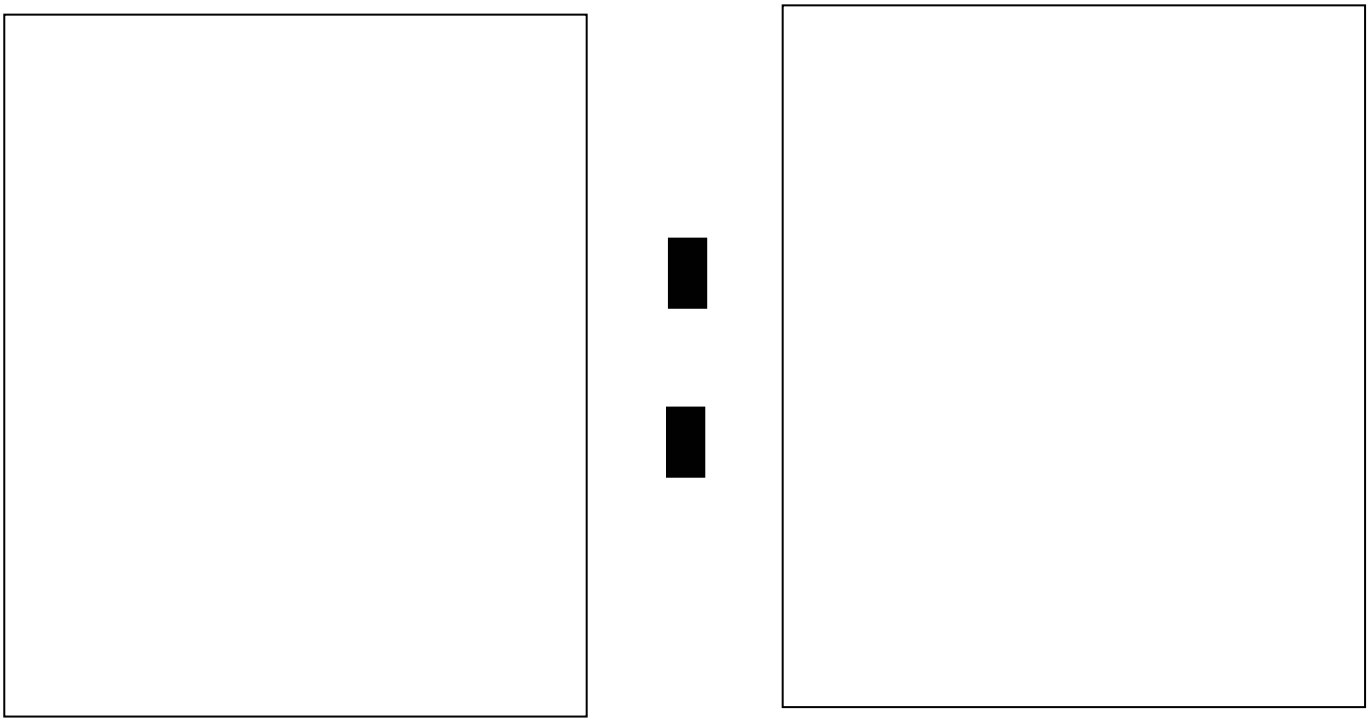
b) Measure the circumference of your thumb in centimeters.

c) What do you notice about the measurements?

d) What is the ratio of your wrist to thumb?

Station: Ratio War

Instructions: Deal from a deck of cards (only Ace to 10 for each suit) to each of the players.
Each player turns over a card for the first term of the ratio and a card for the second term of the ratio and places on the mat provided.
The player with the larger ratio wins the turn.



Unit 1: Day 3: Review of Equations

MBF3C

Materials
BLM1.3.1,
BLM1.3.2
BLM1.3.3

Description

This lesson is designed to activate student's prior knowledge of solving equations.

Assessment Opportunities

Minds On ...

Individual → KWL chart

Have the students fill out BLM1.3.1 the "What do I know" and "What do I want to know" sections of the KWL chart, with regards to their knowledge of equations.

Action!

Individual → Practice

Students should be given time to first work on the equations on BLM 1.3.2.

Pairs → Share

Students check each others answers, and discuss their strategies for solving equations.

Whole Class → Brainstorm

Take up the 4 equations solved and then as a class brainstorm the methods involved in solving each of the different types of equations. Model a formal check for the first equation and have the students check their answers for the other 3 equations.

Consolidate Debrief

Individuals → Practice

Students use their algorithms to solve and check the following equations:

1) $2(x + 3) = 20$
2) $-3(x + 7) = -33$
3) $9 + x = 4x$
4) $\frac{x}{4} = 3$
5) $\frac{2}{3}x = -2$
6) $\frac{x}{6} - 5 = \frac{5}{6}x + 10$

Answers: 1) $x = 7$ 2) $x = 4$ 3) $x = 3$ 4) $x = 12$ 5) $x = -3$ 6) $x = -15$

Home Activity or Further Classroom Consolidation

Practice

Students complete BLM1.3.2 "Solving and Checking Equations" to consolidate their skills.

Name:
Date:

MBF3C
BLM1.3.1

KWL chart for Equations

(What I Know, What I want to Know, and What I have Learned)

Concept, Term, or Diagram	**K** **What do I KNOW?**	**W** **What do I WANT to Know?**	**L** **What have I LEARNED?**
Equations			

Name:
Date:

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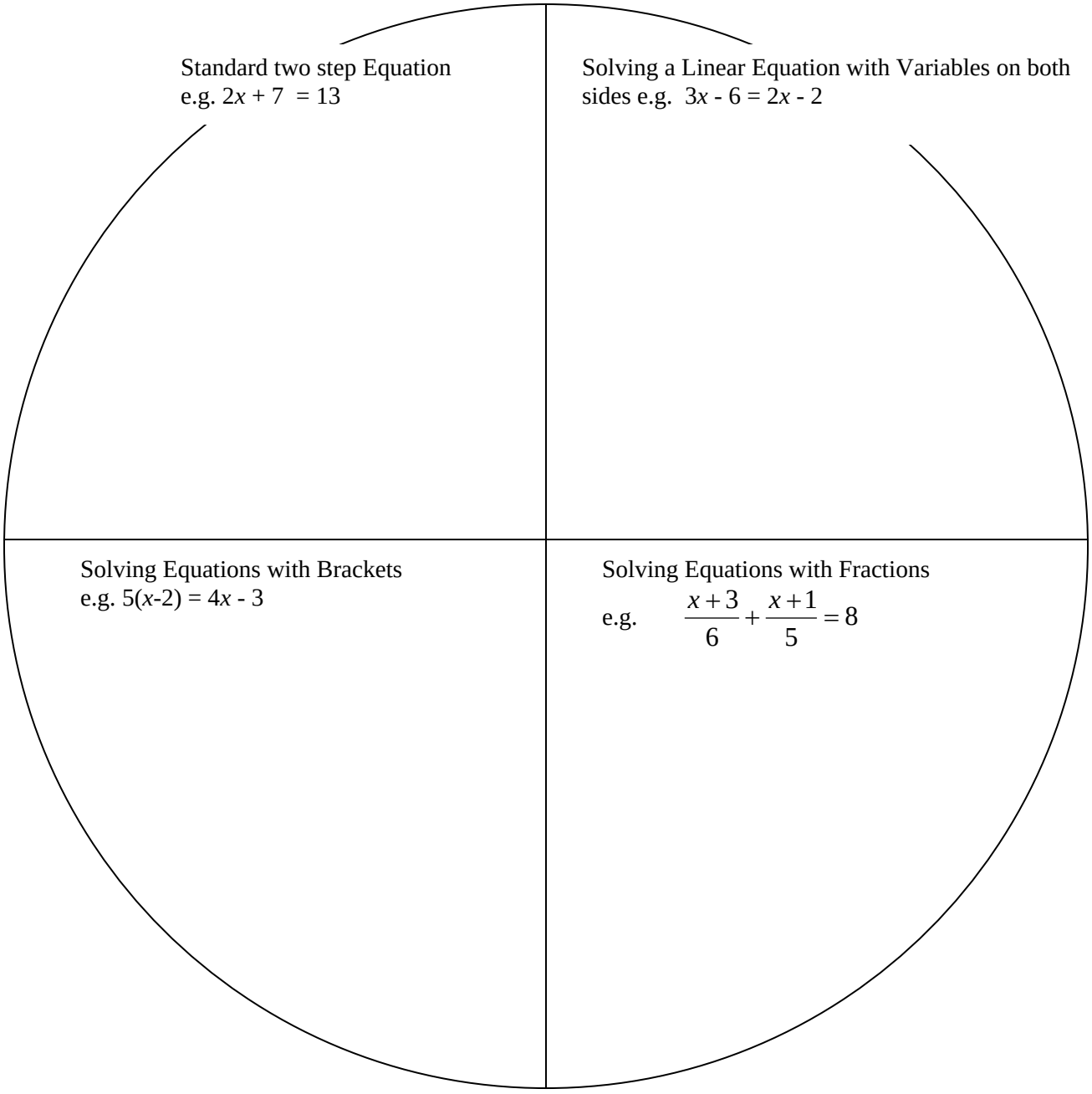
BLM1.3.2

Solve the equations. Indicate on the Concept Circle the methods/steps you used to solve the equations.



MBF3C
BLM1.3.2

Sample Solution:

Standard Two Step Equation

$2x + 7 = 13$

"A"

Steps

1) get rid of what is on the same side as the variable but not connected to it (use opposite operations of + and -) Be certain that whatever you do to the L.S you Do to the R.S

2) get rid of what is connected to the variable (use opposite operations of multiply and divide) Be certain to balance the equation.

Solving a Linear Equation with Variables on both sides $3x - 6 = 2x - 2$

Steps:

1) decide which side to collect your variables onto (usually the side with the largest coefficient)

2) refer to steps in quadrant "A"

Solving Equations with Brackets

$5(x-2) = 4x - 3$

Steps:

1) use the distributive property

2) simplify

3) refer to the steps in quadrant "A"

Solving Equations with Fractions

$$\frac{x+3}{2} + \frac{x+1}{5} = 8$$

Steps:

1) multiply all parts through by what would be the CD (common denominator)

2) use the distributive property if necessary

3) collect like terms

4) refer to the steps in quadrant "A"

MBF3C Name:
BLM 1.3.3 Date:

Solving and Checking Equations

Solve and Check the following Equations.

1) $15 = 23 - 4x$

2) $3(x - 4) = 12$

3) $2 - 5x = -1 - 4x$

4) $3(1-x) = -2(1- x)$

5) $\frac{x}{6} - 5 = \frac{1}{2}x + \frac{1}{3}x - 4$

Answers 1) $x = 2$ 2) $x = 8$ 3) $x = 3$ 4. $x = 1$ 5. $x = 6$

Materials

Description

This lesson is designed to activate student's prior knowledge of similar triangles.

Assessment Opportunities

Minds On ...

Whole Class → Discussion

As a review from day 2 go back over the Graffiti chart for Similar Figures. Recall the properties of similar figures (the sides and angles). You may wish to discuss the difference between Similar and Congruent (SSS, SAS, ASA)

Recall the three properties of Similar triangles 1) corresponding angles are equal 2) the ratio of corresponding sides are equal; and 3) the ratio of the areas is equal to the square of the ratio of the corresponding sides.

Students may use terminology of dilation or enlargement.

Action!

Whole Class → Direct Instruction

On board or overhead demonstrate various examples from BLM1.4.1.

Consolidate Debrief

Pairs → Practice

Have each pair create three similar triangles questions and prepare solutions for the questions. Each pair trades their questions with another pair. Each pair solves for the given questions and returns to the owner to be marked.

Home Activity or Further Classroom Consolidation

Practice

Students complete BLM1.4.2.

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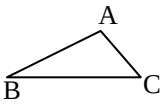
BLM1.4.1

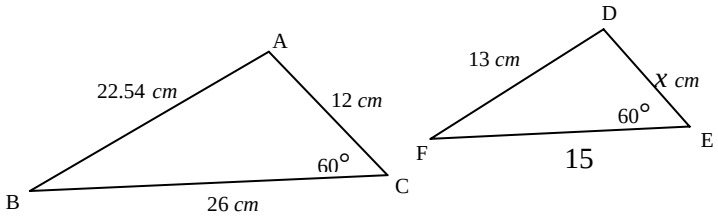
Similar Triangles (Teacher Copy)

1) Name the Triangle, the angles, and the sides.



Triangle Names:
ΔABC, or ΔBCA, or ΔCAB.
Side Names: BC or a; AC or b, and AB or c.
Angle Names are $\angle A$ or $\angle BAC$ or $\angle CAB$,
$\angle B$ or $\angle ABC$ or $\angle CBA$, and $\angle C$ or $\angle ACB$ or $\angle BCA$

2) Why are the following triangles similar? Solve for *x*.



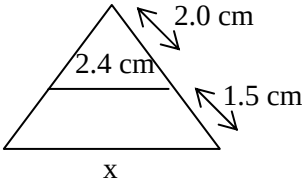
The corresponding angles C and E are equal at 60 degrees. The ratio of the corresponding sides $\frac{BC}{FE} = \frac{BA}{FD} = 1.733$.

The side x can be found by solving the equation $\frac{BC}{FE} = \frac{AC}{DE}$

$$\frac{26}{15} = \frac{12}{x}$$

Thus x = 6.92 cm

3) The two triangles are similar. Determine the length represented by *x*.



Remind students to take the smaller triangle off of the larger triangle. Then the ratio is "little triangle to big triangle", that is

$$\frac{x}{2.4} = \frac{2}{(2+1.5)}$$

$$\frac{x}{2.4} = \frac{2}{3.5}$$

x = 1.37 cm

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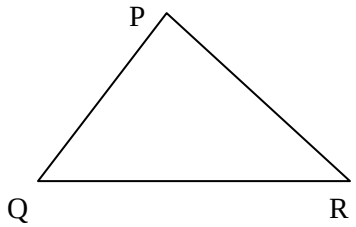
BLM 1.4.2

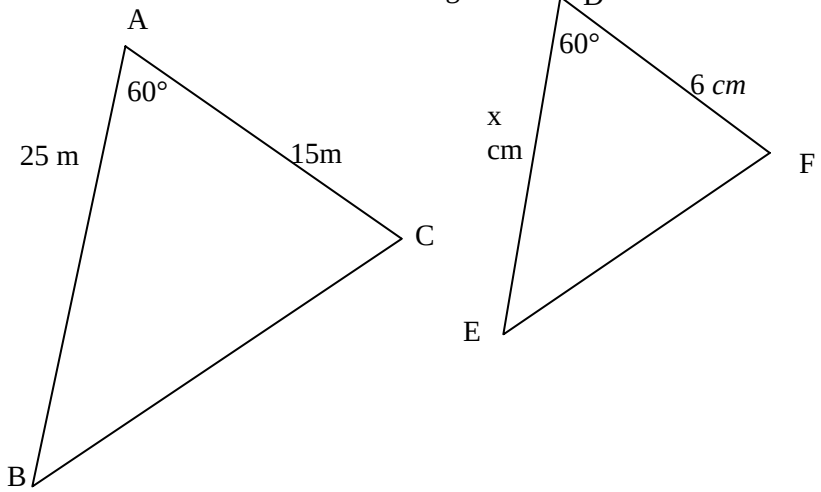
Name:
Date:

Solving for Similar Triangles

1. Name the triangle, the sides and the angles.

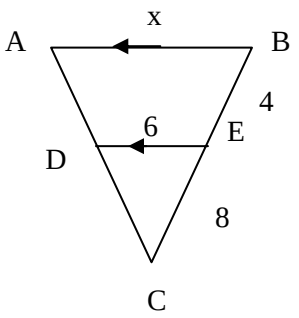


2. Find the value of x in the similar triangles

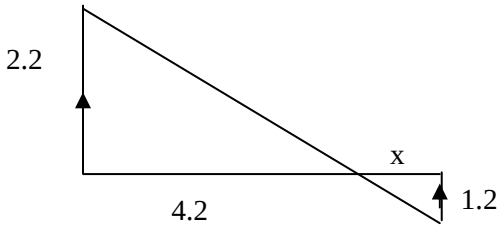


3. Determine if the triangles are similar, and if they are state how you know this, and find the value of x.

a)



b)



Answers:

1. One such naming is Triangle PQR (remember it doesn't matter which way you name it as long as you are consistent), sides p, q, and r and angles P, Q, and R

2. x = 10 3a) x = 9 3b) x = 2.29