

FROEBEL BILINGUAL SCHOOL
A STEM SCHOOL

MATH SKILLS
SHARPENERS
GOING TO TENTH GRADE

MATH SUMMER WORKBOOK

10

A STEM School

FROEBEL
BILINGUAL SCHOOL

Home of the Space Generation



2023 SUMMER MATHEMATIC SKILLS SHARPENER Going to Tenth Grade

STUDENT'S NAME	DATE
TEACHER COMING FROM	SCORE
TEACHER GOING TO	
PARENT'S SIGNATURE	DATE RECEIVED

SKILLS SHARPENER FOR STUDENTS GOING TO TENTH GRADE MATH

WEEK 1.

Day 1.1- Evaluate the expression using the order of operations.

1) $8 \div 2 (2 + 2)$

2) $9 (5 - 3)^3$

3) $100 \cdot 2 \div 40 - 16 \div 4$

4) $550 - (11^2 - 7^2 \cdot 2)^2$

Day 1.2- Find the sum.

1) $-14 + 30$

2) $-9 + 12 + (-4)$

3) $-21 + (-34)$

4) $-22 + (-13) + 6$

Day 1.3- Find the difference.

1) $13 - (-8)$

2) $4 - (-20)$

3) $-2 - (-24)$

4) $-21 - (-6)$

Day 1.4- Evaluate the expression and simplify.

1) $4x + 2x$

2) $4(x + 1) + 2x + 5$

3) $10a - 3a$

4) $10y - 3(6 - y)$

5) $2(x - 4)$

6) $8c + 2 + 2(c + 2)$

7) $8(k + 2)$

WEEK 2.

Day 2.1- Solve multi-step equations.

1) $10 + 3(g + 2) = 31$

2) $12(y + 3) - 3y = 117$

3) $20 = 14 + 3(e + 8)$

4) $-2(i - 6) + 7 = 35$

5) $-25 + 4(2r + 5) = -61$

6) $2x - x + 1 = 5$

7) $17h - 47 + 6h = 160$

8) $2p + 8 + 4p = 128$

9) $48 = 15 + 6(4 + a) - 3a$

10) $23 - 7(b + 3) + 5b = 10$

Day 2.2- Solve equations with variables on both sides.

1) $11t + 14 = 95 - 16t$

2) $9n + 64 = -144 - 17n$

3) $13e - 45 = 36 + 4e$

4) $2b - 6 = -8b + 14$

5) $6p + 2 = 9p - 4$

Day 2.3- Solve the following polynomials and simplify.

1) $(3x - 7) + (2x^2 - 8x + 6)$

2) $(2z - 9z^2 + 2) + (2z^2 - 4z + 8)$

3) $(e^2 - 3e - 2) + (2e^3 + 5e^2 + 3e)$

4) $(x + 2) - (-x^2 - 5x - 3)$

5) $(5m + 3) - (6m^3 - 2m - 2)$

Day 2.4- Solve the following polynomials and simplify.

1) $(2r)(4r)$

2) $(3a^3b)(2ab)$

3) $2x(x^2 - 4x + 6)$

4) $-3ab(ab - 2a^2b + 5a)$

5) $(2q + 6)(4q + 5)$

6) $(5g - 8)(4g - 1)$

7) $(2x + 4)^2$

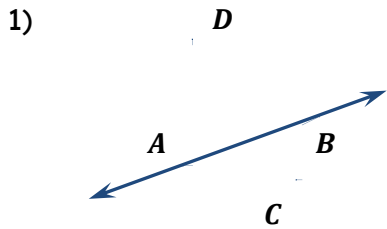
8) $(3a^2 - b)^2$

9) $(p^2 + 3p)(9p^2 - 6p - 5)$

10) $(x^3 + y^2)(x^3 - y^2)$

WEEK 3.

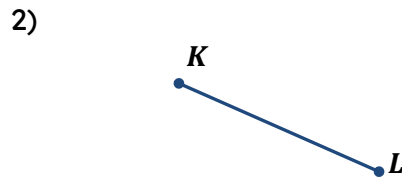
Day 3.1- Use the figure to name each of the following.



Line:

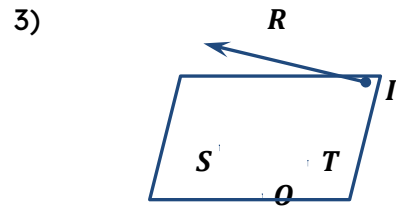
Points:

Collinear points:



Line segment:

Points:



Plane:

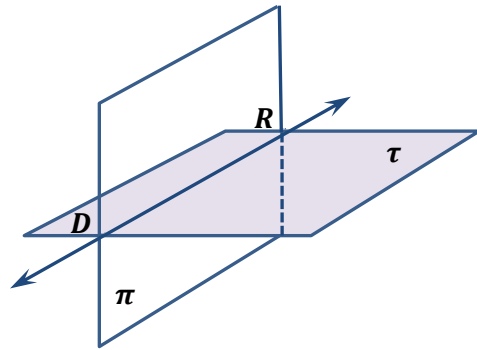
Ray:

Points:

Coplanar points:

Non coplanar points:

4) The intersection of plane π and plane τ is:



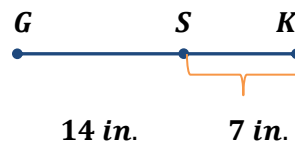
Day 3.2- Find the length of each segment using segment addition postulate.

1) Point G is between points S and K .

The points are collinear.

$$GS = 14 \text{ in.} \quad SK = 7 \text{ in.}$$

$$\overline{GK} = ?$$

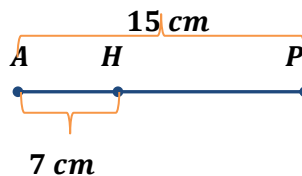


2) Point H is between points A and P .

The points are collinear.

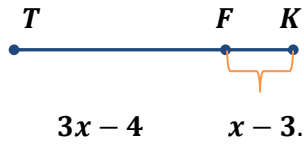
$$AP = 15 \text{ cm} \quad AH = 7 \text{ cm}$$

$$\overline{HP} = ?$$

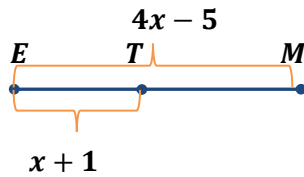


Find the value of x and then, find the length of each segment using segment addition postulate.

- 3) Point F is between points T and K .
The points are collinear.
 $TF = 3x - 4$ $FK = x - 3$ $TK = 9$
 $\overline{TF} = ?$ $\overline{FK} = ?$

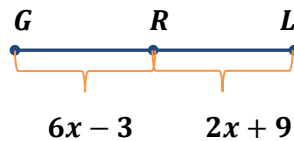


- 4) Point T is between points E and M .
The points are collinear.
 $EM = 4x - 5$ $ET = x + 1$ $TM = 9$
 $\overline{EM} = ?$ $\overline{ET} = ?$

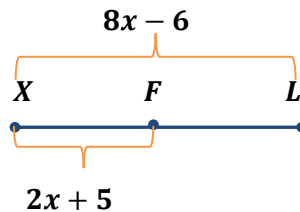


Day 3.3- Find the value of x and then find the length of each segment. Draw a diagram to represent the situation.

- 1) Point R is midpoint of segment \overline{GL} .
 $GR = 6x - 3$ $RL = 2x + 9$
 $\overline{GR} = ?$ $\overline{RL} = ?$ $\overline{GL} = ?$



- 2) Point F is midpoint of segment \overline{XL} .
 $XL = 8x - 6$ $XF = 2x + 5$
 $\overline{XL} = ?$ $\overline{XF} = ?$ $\overline{FL} = ?$

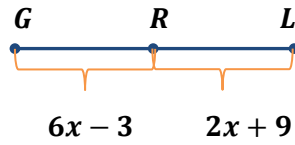


Find the value of x and then find the length of each segment. Draw a diagram to represent the situation.

- 3) Point R is midpoint of segment \overline{GL} .

$$GR = 6x - 3 \quad RL = 2x + 9$$

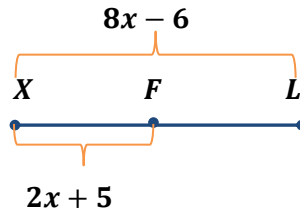
$$\overline{GR} = ? \quad \overline{RL} = ? \quad \overline{GL} = ?$$



- 4) Point F is midpoint of segment \overline{XL} .

$$XL = 8x - 6 \quad XF = 2x + 5$$

$$\overline{XL} = ? \quad \overline{XF} = ? \quad \overline{FL} = ?$$



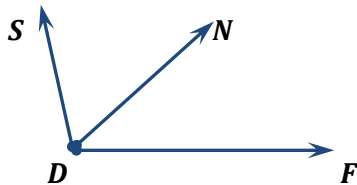
Day 3.4 - Classify the following angles as acute, right, obtuse, or straight.

- 1) 2) 3)

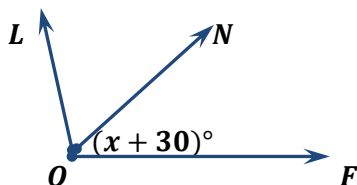
WEEK 4.

Day 4.1 - Find the indicated angle measures.

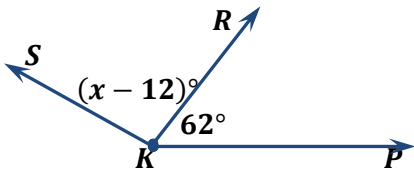
- 1) If \overrightarrow{DN} bisects $\angle FDS$ and $m\angle FDS = 104$, find $m\angle FDN$ and $m\angle NDS$.



- 2) If \overrightarrow{ON} bisects $\angle FOL$ and $m\angle FOL = 4x - 10$, $m\angle FON = x + 30$, find $m\angle FON$, $m\angle FOL$ and $m\angle NOL$.

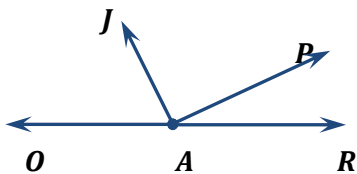


- 3) If $m\angle PKR = 62$, $m\angle RKS = x - 12$,
and $m\angle PKS = 3x + 10$, what are
 $m\angle RKS$ and $m\angle PKS$?



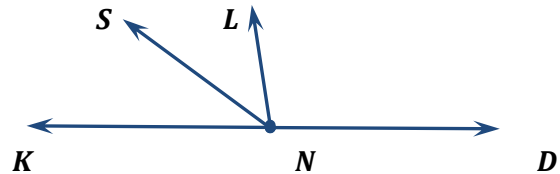
Day 4.2 - Tell whether the angles are only adjacent, adjacent and form a linear pair or not adjacent.

1)



$\angle OAJ$ and $\angle PAJ$ –
 $\angle RAP$ and $\angle OAP$ –

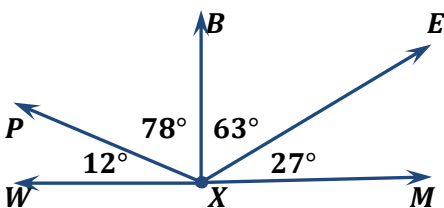
2)



$\angle KNS$ and $\angle SNL$ –
 $\angle SND$ and $\angle KNS$ –

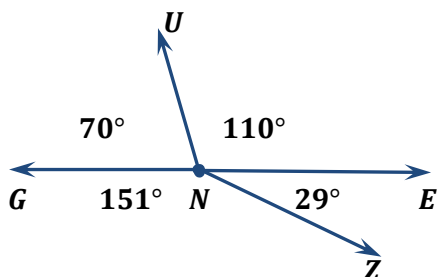
Day 4.3 - Name a pair of adjacent complementary angles.

1)



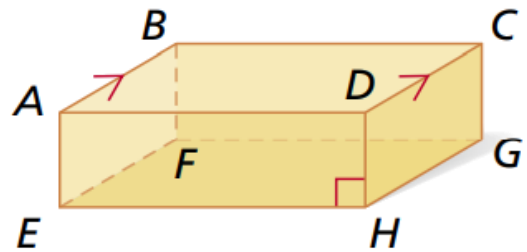
Name a pair of adjacent supplementary angles.

2)



Day 4.4 - Identify each of the following in the figure:

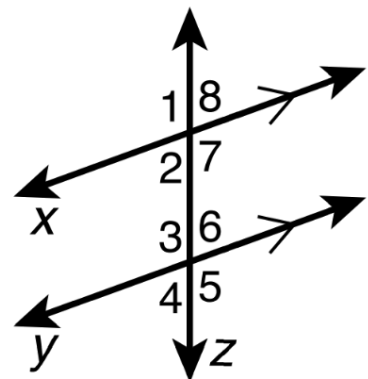
1. A pair of parallel segments
2. A pair of skew segments
3. A pair of perpendicular segments
4. A pair of parallel planes



WEEK 5.

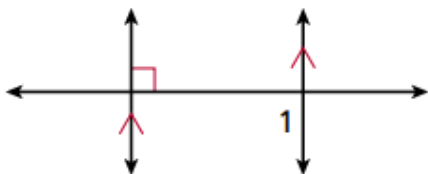
Day 5.1 - Identify each of the following in the figure:

1. a transversal
2. parallel lines
3. corresponding angles
4. alternate interior angles
5. alternate exterior angles
6. same-side interior angles

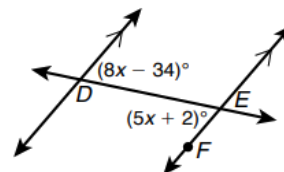


Day 5.2- Find each angle measure:

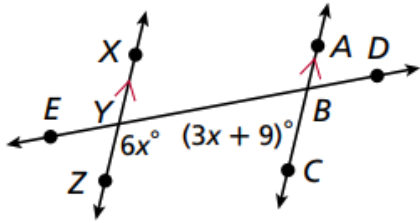
1) $m \angle 1$



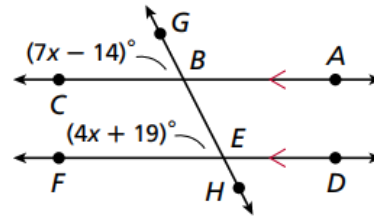
2) $m \angle DEF$



3) $m \angle CBY$



4) $m \angle BEF$

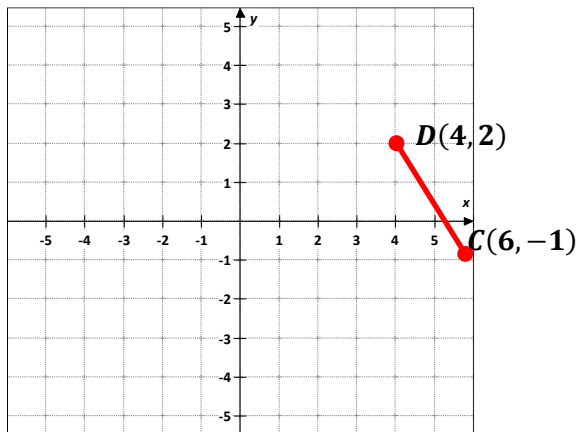


Day 5.3 - Find the coordinate of the midpoint of the segment with the given endpoints.

1) **Segment \overline{CD}**
 $C(6, -1)$
 $M = ?$

$D(4, 2)$

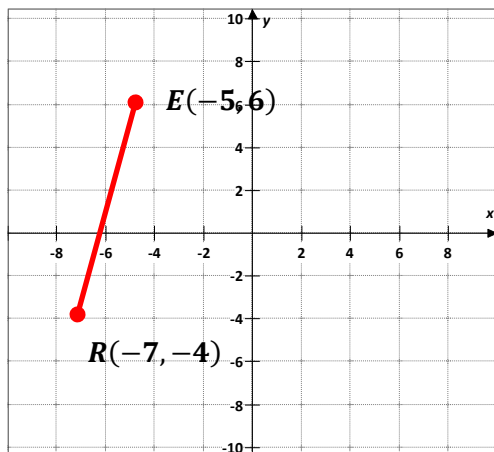
$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$



2) **Segment \overline{ER}**
 $E(-5, 6)$
 $M = ?$

$R(-7, -4)$

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$



Day 5.4 - Find the distance between each pair of points. Round to the nearest tenth.

1) $S(4, 1)$
 $d(S, K) = ?$

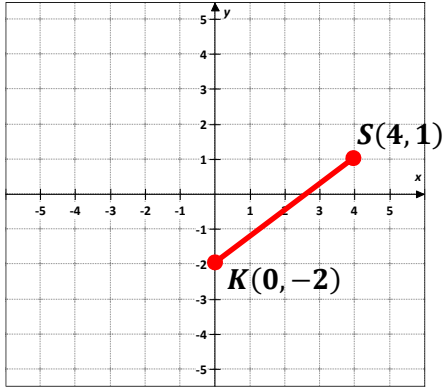
$K(0, -2)$

$S(4, 1)$

$K(0, -2)$

$d(S, K) = ?$

$$d(S, K) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



2) $L(-5, 5)$
 $d(L, M) = ?$
 $L(-5, 5)$

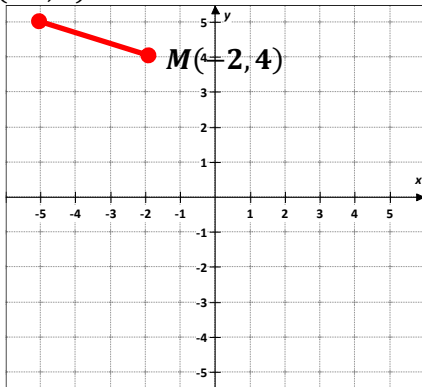
$M(-2, 4)$

$L(-5, 5)$

$M(-2, 4)$

$d(L, M) = ?$

$$d(L, M) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



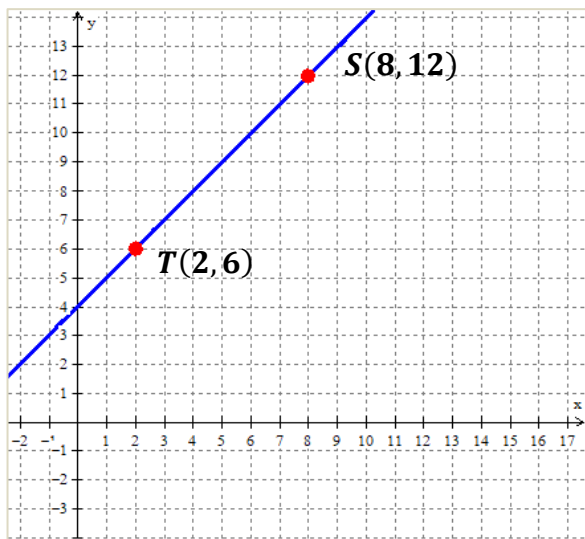
WEEK 6.

Day 6.1- Find the slope of the line passing through the given points.

1. $M(6, 2)$ $N(8, 3)$

2. $K(1, -5)$ $L(7, -7)$

3.



Day 6.2 - Find the slope of each line. Which lines are parallel, perpendicular or neither?

- 1) **Line s** $(-6, 5)$ $(-5, 10)$
Line t $(5, -6)$ $(6, -1)$

- 2) **Line a** $(-4, 3)$ $(-2, 4)$
Line b $(9, 10)$ $(8, 12)$

Day 6.3 - Identify what is being described and choose the best answer.

Transformation
Translation

Pre-Image
Reflection

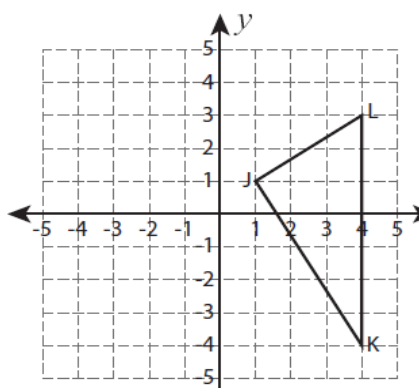
Image
Rotation

- 1) The final shape and position of a given figure under a transformation.
- 2) The term used to describe the way a given shape or a graph changes its position or direction.

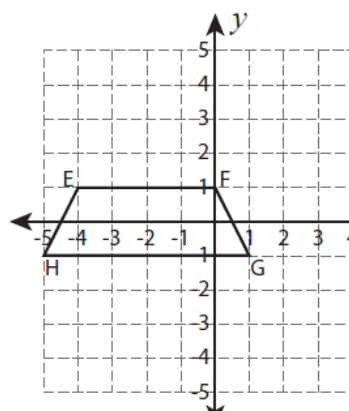
- 3) Also known as FLIP, which mirrors a given shape.
- 4) A movement by sliding all the points with the same distance and direction.
- 5) Given a central point, the shape or graph can be moved clockwise or counterclockwise

Day 6.4- Determine the coordinates of the new position of each of the following figures given the rotation.

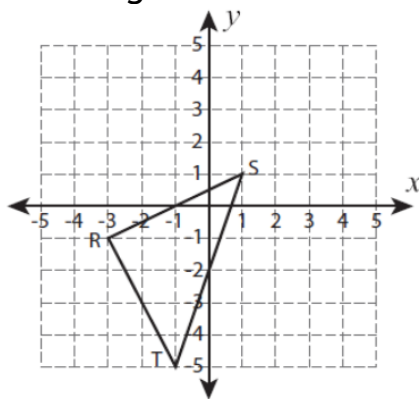
1) 90 degrees rotation



2) 270 degrees rotation



3) 180 degrees rotation



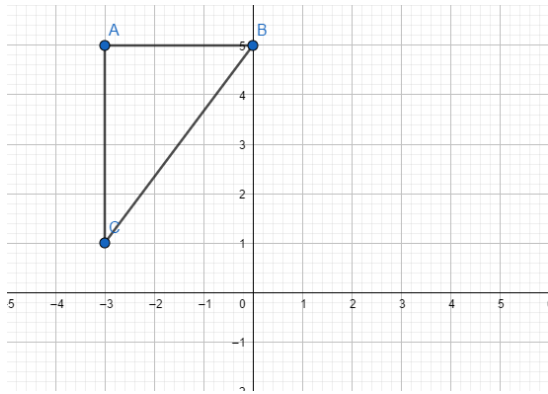
WEEK 7.

Day 5.1- Find the coordinates of the vertices of each figure after the given transformation.

- 1) Reflection across the x -axis.
 $A(1, -1)$, $B(4, 0)$, $C(4, -4)$

- 2) Reflection across the y -axis.
 $R(-3, -5)$, $N(-4, 0)$, $V(-2, -1)$, $E(0, -4)$

3) Graph the image of the figure across the line $y = x$.



Day 7.2- Find the coordinates of the vertices of each figure after the given translation.

1) 8 units down and 7 units to the right.

$A(-5, 3), B(-3, 3), C(-2, 5), D(-5, 4)$

A' : _____ C' : _____

B' : _____ D' : _____

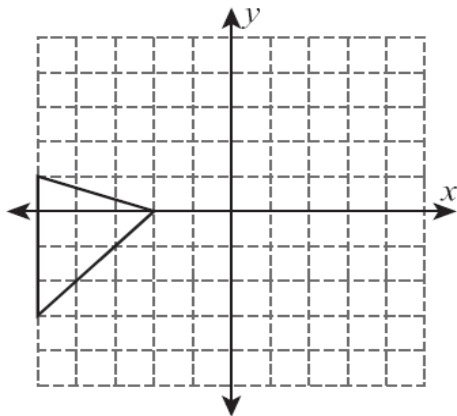
2) 6 units to the right and 6 units down

$T(-5, 2), U(-1, 2), V(-2, 4), W(-4, 4)$

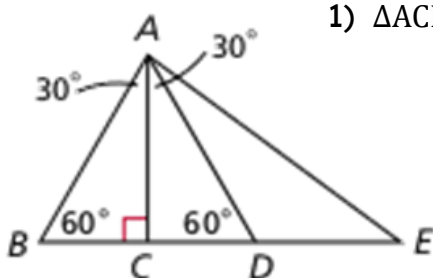
T' : _____ V' : _____

U' : _____ W' : _____

3) Translate the figure 7 units to the right and 2 units up



Day 7.3 - Classify each triangle by its angle measures. (Acute, right, or obtuse)



1) $\triangle ACD$

2) $\triangle ABD$

3) $\triangle ADE$

Day 7.4- Classify each triangle by its side. (Equilateral, isosceles, or scalene)



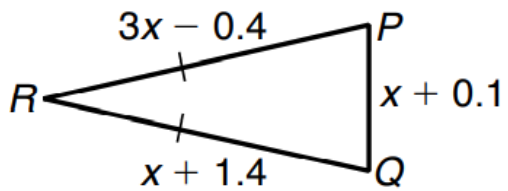
1) $\triangle PQR$

2) $\triangle PRS$

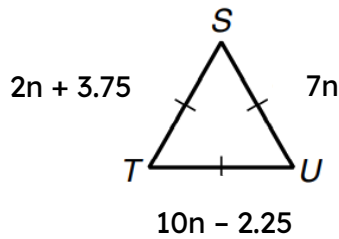
3) $\triangle PQS$

WEEK 8.

Day 6.1- Find the side lengths of each triangle

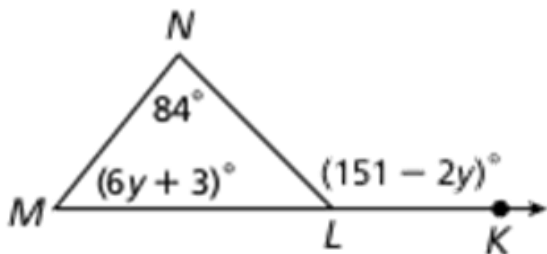


- 1) $x =$
- 2) $\overline{RP} =$
- 3) $\overline{PQ} =$
- 4) $\overline{RQ} =$

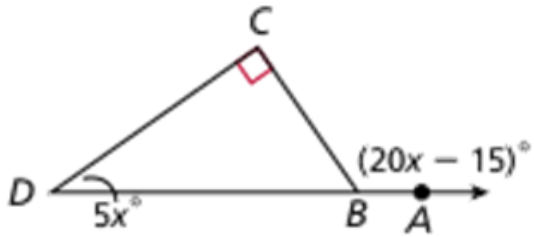


- 1) $n =$
- 2) $\overline{TS} =$
- 3) $\overline{US} =$
- 4) $\overline{TU} =$

Day 8.2- Find each value.

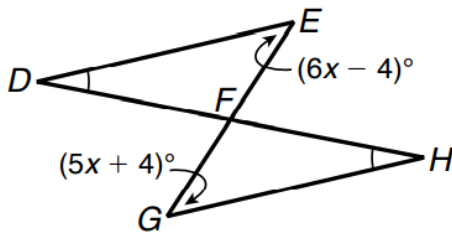


- 1) $y =$
- 2) $\angle NML$

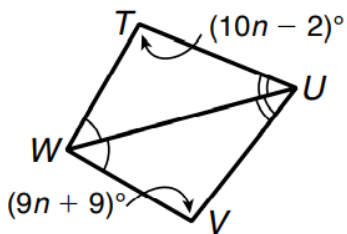


- 1) $x =$
- 2) $\angle ABC$

Day 8.3 - Find each value.



- 1) $x =$
- 2) $\angle DEF$



- 1) $n =$
- 2) $\angle WVU$

Day 8.4- Given: $\triangle JKL \cong \triangle DEF$. Identify the congruent corresponding parts

- 1) $\angle K \cong$ _____
- 2) $\overline{DF} \cong$ _____
- 3) $\overline{KJ} \cong$ _____
- 4) $\angle F \cong$ _____
- 5) $\overline{LK} \cong$ _____



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