

OPEN SCHOOL BC

FOUNDATIONS OF MATHEMATICS AND PRE-CALCULUS 10

Introduction Assignment

Welcome to FMP 10! This assignment will help you review some topics from a previous math course. The last part asks you to provide your teacher with information about your previous experiences in math.

Student Name _____

Student No. _____ Date _____

Address _____ Postal Code _____

Complete the following *Foundations of Mathematics and Pre-Calculus 10* Assignment independently and return it to your teacher based on the instructions provided by your school. No external resources are required to complete this assignment.

There are five parts to this assignment:

Part 1: Linear Relations and Graphing	10 marks
Part 2: Similar Triangles	12 marks
Part 3: Polynomials	10 marks
Part 4: Transformations	8 marks
Part 5: About You	10 marks

Contents:

17 pages

Assignment time:

2 hours

Part 1: Linear Relations and Graphing (10 marks)

You have a string of licorice 15 cm long which you want to cut into two pieces. What are all the possibilities for the different sizes of the pieces?

This problem is an example of a linear relation. Linear relations can be expressed in a number of ways: in words, as an equation, in a table, or as a graph, among others.

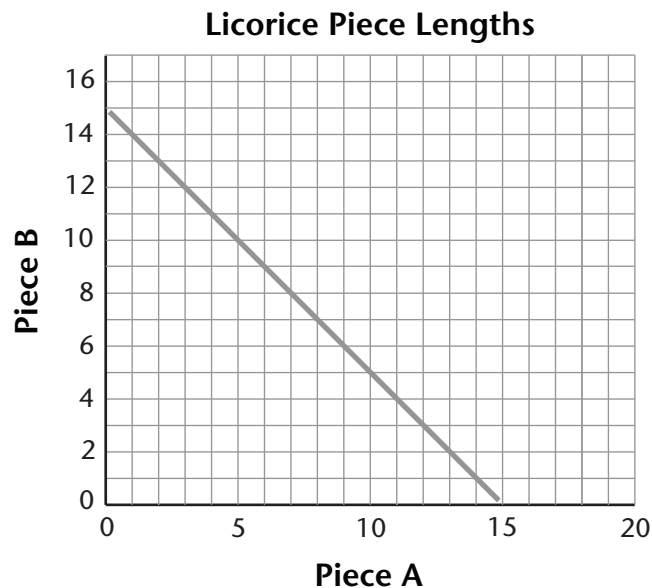
In words: The sum of the lengths of two pieces of licorice is 15 cm.

As an equation: $A + B = 15$

In a table

Piece A	Piece B
0.5	14.5
2	13
7	8
10	5

As a graph



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Now you'll see another linear relation expressed in words, and you'll be asked to provide three other formats.

In words: The sum of two integers, x and y , is -2 .

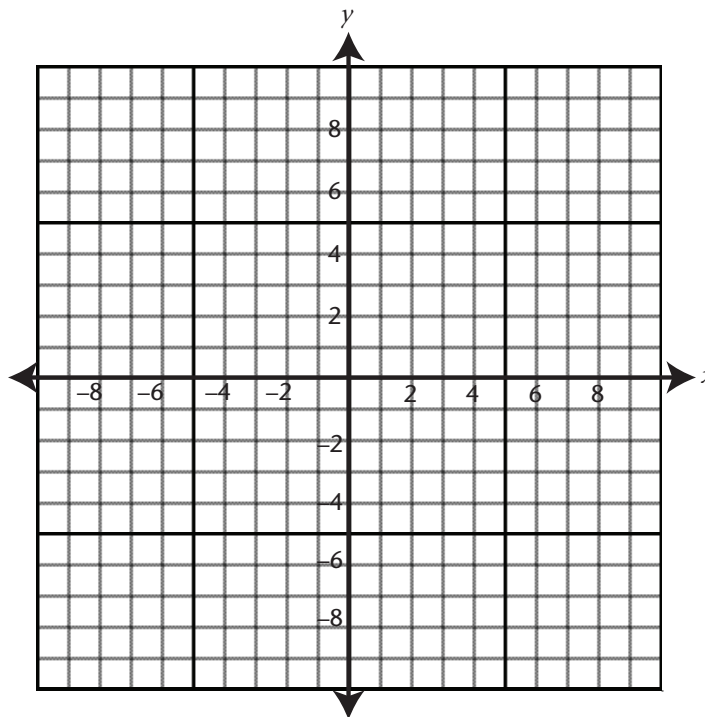
1. Show the linear relation described above:

a. As an equation: _____ (2 marks)

b. In a table (4 marks)

x	y
-5	3
10	-12

c. As a graph (4 marks)

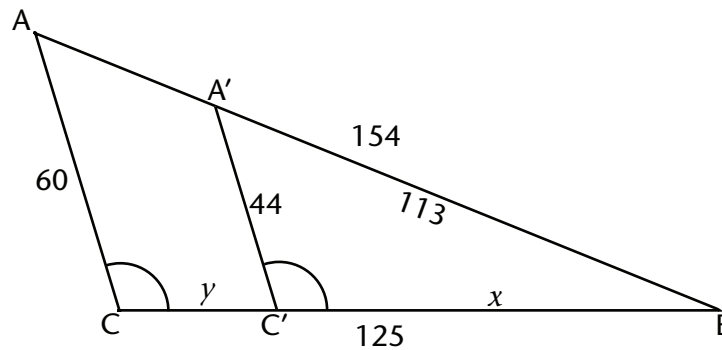


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Part 2: Similar Triangles (12 marks)

$\triangle ABC$ is similar to $\triangle A'BC'$.

The measures of the sides of $\triangle A'BC'$ are given inside the triangle, and the measures of $\triangle ABC$ are outside.



Pairs of corresponding sides have lengths in the same ratio. You can find this ratio by comparing the lengths any two corresponding sides:

$$\frac{AB}{A'B} = \frac{154}{113} \approx 1.36 \qquad \frac{AC}{A'C'} = \frac{60}{44} \approx 1.36$$

In the example, the measures of x and y are missing. You can use the information given to solve for these measures.

We'll find the measure of x (the length $C'B$) to the nearest tenth.

We can set up a ratio using two pairs of corresponding sides, including the unknown side. When you set up the ratio, put the unknown measure in the numerator because it will be easier to solve.

$$\begin{aligned} \frac{A'B}{AB} &= \frac{x}{CB} \\ \frac{154}{113} &= \frac{x}{125} \\ x(154) &= (113)(125) \\ x &= \frac{(113)(125)}{154} \\ x &= 91.7 \end{aligned}$$

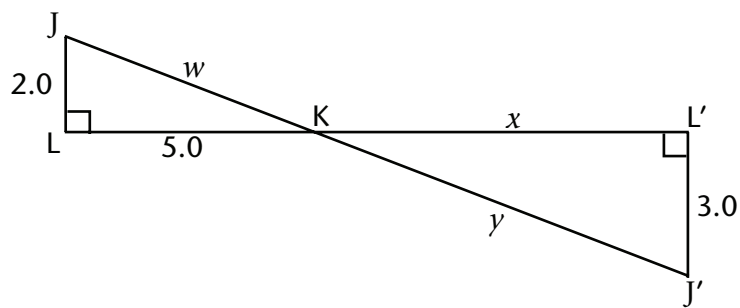
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Now that we know the measure of x , we can solve for y (the length of CC') because it is the difference between the full length (CB) and the measure of x (the length of $C'B$).

$$\begin{aligned}y &= CB - x \\y &= 125 - 91.7 \\y &= 33.3\end{aligned}$$

Now it's your turn.



ΔJKL is similar to $\Delta J'KL'$. $\angle JKL$ and $\angle J'KL'$ are congruent (because they are opposite angles).

Answer the following questions to the nearest tenth.

1. Solve for the length x . (2 marks)

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2. Use the measure that you calculated in question 1 and the Pythagorean Theorem ($a^2 + b^2 = c^2$) to calculate the length of the hypotenuse γ . (2 marks)

3. Solve for w (the length of JK). (2 marks)

Another triangle, $\triangle DEF$, is similar to $\triangle JKL$. The measure of DE is 12".

4. Redraw $\triangle JKL$, then draw $\triangle DEF$ and include the given measurement. (2 marks)

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5. Solve for the measure of $\angle E$. (2 marks)

6. Solve for the measure of $\angle D$. (2 marks)

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Part 3: Polynomials (10 marks)

Here are some examples to remind you about polynomial operations.
Answer the questions that follow each example.

Example: Simplify $-2x^2 + 4 + 5x + 7x^2 - 2 + 12xy - 7x - 2xy$

Group like terms: $-2x^2 + 7x^2 + 4 - 2 + 5x - 7x + 12xy - 2xy$

Combine like terms: $5x^2 + 2 - 2x + 10xy$

Rewrite: $5x^2 + 10xy - 2x + 2$

1. Simplify the following polynomials. (2 marks)

a. $2a - 5a^2 + 4a + 5 + 3a - 7a^2 - 7a$

b. $7 + 4ab - 12a + 11ab + 5b - 9ab + 6a$

Example: Add $(4y^2 - 7y - 3) + (3y^2 + 6y - 2)$

Group like terms: $4y^2 + 3y^2 - 7y + 6y - 3 - 2$

Combine like terms: $7y^2 - 1y - 5$

2. Add the following polynomials. (2 marks)

a. $(2p^2 + 6p - 5) + (p^2 + 3p + 1)$

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b. $(10xy - 4y^2 + 5x + 2) + (-3xy + 5y - 4)$

Example: Subtract $(-10ab + 6b - 7) - (3ab - 2b - 5)$

Subtract each term: $-10ab + 6b - 7 - 3ab - (-2b) - (-5)$

Add the opposite terms: $-10ab + 6b - 7 - 3ab + 2b + 5$

Group like terms: $-10ab - 3ab + 6b + 2b - 7 + 5$

Combine like terms: $-13ab + 8b - 2$

3. Subtract the following polynomials. (2 marks)

a. $(-4t - 5) - (4t - 5)$

b. $(3y^2 - y + 2) - (2y^2 - 2y + 3)$

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Example: Multiply by a constant $-5(3y^2 + 5x^2 - 4xy + 2)$

Use the Distributive Property: $(-5)(3y^2) + (-5)(5x^2) - (-5)(4xy) + (-5)(2)$

Multiply: $-15y^2 + (-25x^2) - (-20xy) + (-10)$

$$-15y^2 - 25x^2 + 20xy - 10$$

4. Multiply the following polynomials by the constant given. (2 marks)

a. $-3(xy + x^2 - 4)$

b. $5(-8 + 5x)$

Example: Divide by a monomial $\frac{4abc + 8ac - 12c}{-2c}$

Rewrite as the sum of fractions: $\frac{4abc}{-2c} + \frac{+8ac}{-2c} + \frac{-12c}{-2c}$

Simplify: $-2ab + (-4a) + 6$

$$-2ab - 4a + 6$$

5. Divide the following polynomials by the given monomial. (2 marks)

a. $\frac{15y^2 - 20y}{-5y}$

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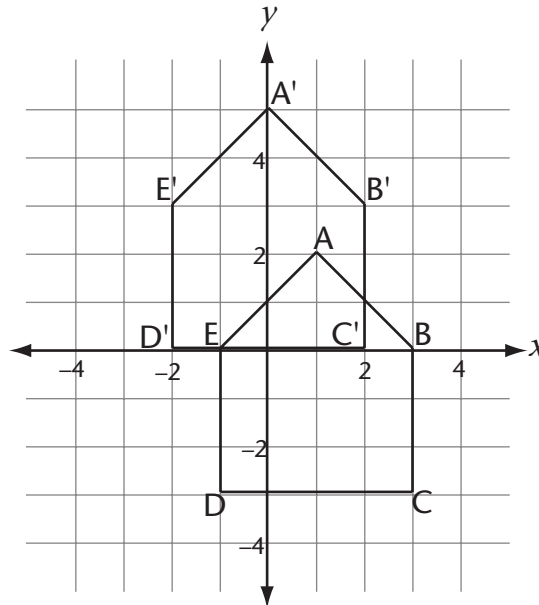
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b. $\frac{14bc + 7c^2}{7c}$

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Part 4: Transformations (8 marks)

The following pentagon ABCDE has been translated one unit left and three units up (L1, U3). Its image is A'B'C'D'E'.



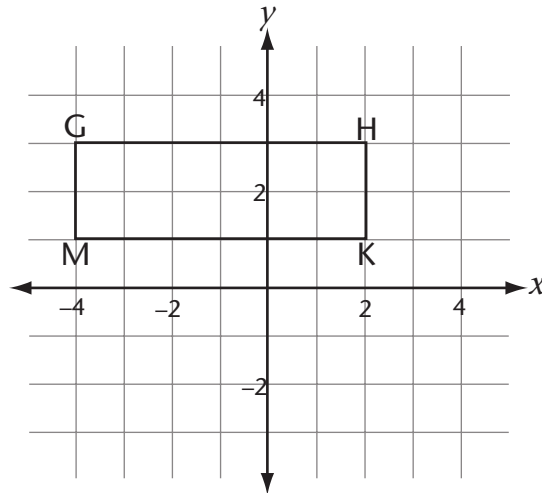
The coordinates of the vertices of the pentagon and its image are shown in the table below.

Point	Image
A (1,2)	A' (0,5)
B (3,0)	B' (2,3)
C (3,-3)	C' (2,0)
D (-1,-3)	D' (-2,0)
E (-1,0)	E' (-2,3)

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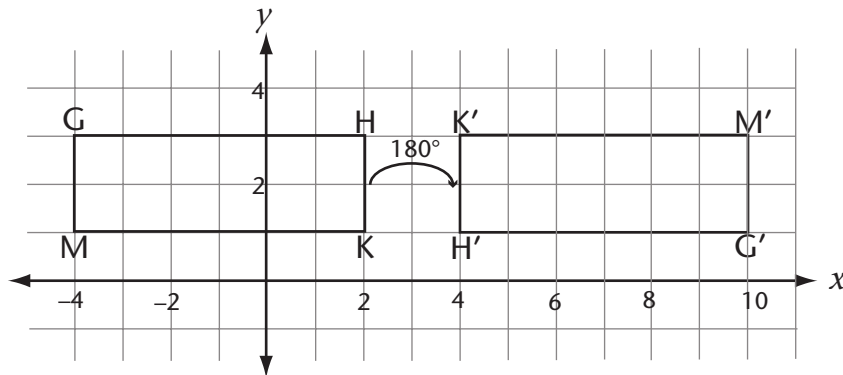
1. Translate the following rectangle one unit to the right and three units down (R1, D3). (2 marks)



2. List the coordinates of the vertices of the rectangle and its image. The first one is done for you. (2 marks)

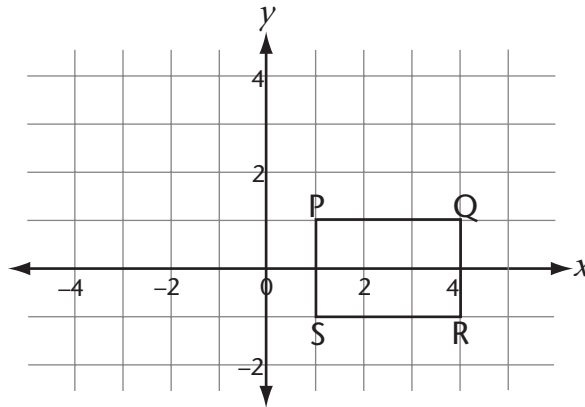
Rectangle	Image
G (-4,3)	G' (-3,0)
H	H'
K	K'
M	M'

The following shape has been rotated 180° about the point (3,2).



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3. Rotate the rectangle shown below 180° about the origin $(0, 0)$ and draw its image. (2 marks)



4. Label the vertices of the image P'Q'R'S' above and write the coordinates of its vertices in the table. (2 marks)

Shape	Image
P (1, 1)	
Q (4, 1)	
R (4, -1)	
S (1, -1)	

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Part 5: About You (10 marks)

Answer the following questions about your last math course.

What was the name of your last math course? _____

When did you finish it? _____

How long did it take you to complete the course? _____

Did you do well in it? _____

Explain: _____

What did you like best about your last math course? _____

Are there certain topics that you find challenging or difficult?

What do you expect to achieve in FMP 10?

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Please add anything else about yourself or your previous experiences in math that may help your teacher guide you through this course.

/10 Part 1: Linear Equations and Graphing

/12 Part 2: Similar Triangles

/10 Part 3: Polynomials

/8 Part 4: Transformations

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50 Total

