

Grade 6 Resources

from



Mathematics Workshop

**“It’s not too late
– Quality lessons to help with exam review”**

March 2003

Prepared by

David Ritchie

Introduction

The materials contained in this package are designed to support review for exams.

The materials model the process of completing an item analysis of the Mathematics Progress Indicator Test and developing lessons to help the students learn the key concepts of the questions.

Using the materials

Step 1

Analyse your class results from Form 1 and Form 2 of the Mathematics Progress Indicator. Use **pages 3 and 4**.

Step 2

Develop lessons that address student misunderstandings.

This means developing reteaching lesson on mis-understood concepts not just going over more exam questions.

Sample lessons have been provided from **page 7 onwards**.

Developing student Exam Strategies

Remember to model exam strategies as you review for the exam. Get a copy of **[“Math Exam Strategies Overview”](#)**

PD Workshops related to these materials

The materials were presented to the District 8 Math Consortium Workshop.

Resources materials from this workshop for Grade 6, 7 and 8 are currently available for download from **www.mathsnet.vic.edu.au/nyc/**

Interpreting and Analysing the Mathematics Progress Indicator Results

A Process

1. Review the success of your students by looking for the questions in which the students performed poorly.
2. Order these questions from poor performance to good performance
3. Analyse the math behind the question
4. Determine a solution or lesson strategy to help improve student performance.

Class:

Level: D

Form: 1

Ranking Poor to Good	Question No.	Math behind the question	Solution or lesson strategies
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

If necessary, add another page.

Interpreting and Analysing the Mathematics Progress Indicator Results

A Process

1. Review the success of your students by looking for the questions in which the students performed poorly.
2. Order these questions from poor performance to good performance
3. Analyse the math behind the question
4. Determine a solution or lesson strategy to help improve student performance.

Class:

Level: D

Form: 2

Ranking Poor to Good	Question No.	Math behind the question	Solution or lesson strategies
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

If necessary, add another page.

Sample Interpretation and Analysis of Mathematics Progress Indicator Results – Level D, Form 1

Ranking	Level D Form 1		
Poor to Good	Question No. less than 40%	Math behind the question	Solution or lesson strategies
1	18	graph interpretation	
2	4	diagram of change then fractions	could use ruler if students can measure and read accurately to eighth of inch
3	21	units conversion grams to kilograms	has this been done
4	46	area and scale	similar scenarios, students draw scale diagrams
5	28 *	probability	conduct similar experiments, drawing from a bag, "Marble Jar Activity"
6	50	input/output machines	similar scenarios, with teacher modelling how to test a number
7	8	units conversion meters to kilometers	has this been done
8	39	problability	<i>conduct similar experiments, design spinner to set probability, Peter Hickey workshop</i>
9	25		
10	34	rates	difficult at need to join 2 parts of the question together, misunderstanding of rates
11	48	problem solving	draw a diagram
12	17	graph interpretation	
13	36 *	axis of symmetry in polygons	construct and draw
14	47		
15	30 *	quadrilateral properties	very tricky, draw diagram
16	49	spending money	
17	42	inequality word problem	
18	32 *	transformation - rotations	Have they done it?
19	43	taxi rate problem	City PAM Favorite - no teacher should exclude this type of problem
20	31	order of operation	Have they done it?
21	37	divisible: key word AND	
22	26	measurement estimate of ounces	Have they done it?
23	11	graph interpretation	
24	9 *	decimal estimation	Modelling estimation by the teacher
25	19	time and tenth of seconds	
26	44	taxi rate problem	City PAM Favorite - no teacher should exclude this type of problem
27	35	elapsed time	Diagram, train schedules
28	41 *	rates - unit rate a good strategy	Have they done it? Do not use proportion and cross multiply
29	6 *	fraction multiplication	Best estimate. Mental Math sheet

Sample Interpretation and Analysis of Mathematics Progress Indicator Results - Level D, Form 2

Ranking	Level D Form 2		
Poor to Good	Question No. less than 40%	Math behind the question	Solution or lesson strategies
1	16	Temperature on thermometer, units of 0.2	Reading and creating scales
2	19	Area of non-right-angled triangle	Have they done it? Make, measure and calculate
3	27	Problem Solving and Modelling	
4	36	Algebraic equation?	Have they done it? Seems to me to be a ridiculous question
5	43	Graph interpretation	Have they done it? Need to do more than draw graphs? Get students to make up questions?
6	44	Dice probability	Have they done it? Simple experiments.
7	45 *	Grid transformations	Have they done it? Slide, reflect, rotate
8	46 *	Algebraic equation?	Table of information
9	47 *	50 / x = 45	Number sense. Structure questions. Calculator exploration. Test strategy: Test and check
10	48	How many turns of wheels?	Reading of question. Model Shared Reading with Overhead Projector
11	37	1.36 pounds - Mixed numbers to lowest terms	
12	26	Graph interpretation	Have they done it? Need to do more than draw graphs? Get students to make up questions?
13	39	Scale Drawing	Have they done it? Similar Problems, more than once
14	42	Graph interpretation - largest increase	Have they done it? Need to do more than draw graphs? Get students to make up questions?
15	49	3 x A < 12 + B	Test strategy: Test and check
16	40	LCm	
17	18	Operation into words	
18	14	Best estimate	
19	50		
20	21		
21	10		
22	31		
23	30		

Computation and Numerical Estimation – Review 6-1-06

Question 6, Form 1, Level D

Which of these is the best estimate of $\frac{1}{3} \times 161$?

F	30
G	50
H	70
J	90

Reading the Question – Key Word

best estimate

The Fundamental Concepts

Estimation involves rounding: 161 can be rounded to 150

The word “of” can be used as a word to replace the multiplication operation

$\frac{1}{3}$ is the same as dividing by 3

(Similarly, $\frac{1}{2}$ is the same as dividing by 2, $\frac{1}{4}$ is the same as dividing by 4)

Re-writing the question

$\frac{1}{3} \times 161 = \frac{1}{3}$ of 150, that is $150 \div 3$

Answer is 50, which will be an under-estimate as 150 is smaller than 161

Under or Over Estimation

When choosing the correct multiple choice response, consider if your estimate is an under or over estimation.

Further Practice

Do similar questions.

Do Mental Math Sheets

Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

Name:

Date:

Mental Maths

Set A

- | | | | | | |
|-----|------|---|-----|---|----------------------|
| 1) | 7 | x | 2 | = | <input type="text"/> |
| 2) | 6 | x | 5 | = | <input type="text"/> |
| 3) | 3 | x | 10 | = | <input type="text"/> |
| 4) | 80 | x | 2 | = | <input type="text"/> |
| 5) | 12 | x | 5 | = | <input type="text"/> |
| 6) | 17 | x | 10 | = | <input type="text"/> |
| 7) | 2.4 | x | 10 | = | <input type="text"/> |
| 8) | 2.4 | x | 5 | = | <input type="text"/> |
| 9) | 2.4 | x | 2 | = | <input type="text"/> |
| 10) | 1.75 | x | 100 | = | <input type="text"/> |

Set B

- | | | | | | |
|-----|----|---|----|---|----------------------|
| 1) | 4 | x | 3 | = | <input type="text"/> |
| 2) | 6 | x | 4 | = | <input type="text"/> |
| 3) | 3 | x | 9 | = | <input type="text"/> |
| 4) | 5 | x | 12 | = | <input type="text"/> |
| 5) | 6 | x | 3 | = | <input type="text"/> |
| 6) | 8 | x | 4 | = | <input type="text"/> |
| 7) | 8 | x | 9 | = | <input type="text"/> |
| 8) | 7 | x | 12 | = | <input type="text"/> |
| 9) | 8 | x | 3 | = | <input type="text"/> |
| 10) | 12 | x | 4 | = | <input type="text"/> |

Set C

- | | | | | | |
|-----|-----------------|----|----|---|----------------------|
| 1) | 30 | ÷ | 10 | = | <input type="text"/> |
| 2) | $\frac{1}{10}$ | of | 30 | = | <input type="text"/> |
| 3) | 10% | of | 30 | = | <input type="text"/> |
| 4) | $\frac{30}{10}$ | | | = | <input type="text"/> |
| 5) | 0.1 | x | 30 | = | <input type="text"/> |
| 6) | 54 | ÷ | 10 | = | <input type="text"/> |
| 7) | $\frac{1}{10}$ | of | 54 | = | <input type="text"/> |
| 8) | 10% | of | 54 | = | <input type="text"/> |
| 9) | $\frac{54}{10}$ | | | = | <input type="text"/> |
| 10) | 0.1 | x | 54 | = | <input type="text"/> |

Set D

- | | | | | | |
|-----|-----------------|----|-----|---|----------------------|
| 1) | 160 | ÷ | 2 | = | <input type="text"/> |
| 2) | $\frac{1}{2}$ | of | 160 | = | <input type="text"/> |
| 3) | 50% | of | 160 | = | <input type="text"/> |
| 4) | $\frac{160}{2}$ | | | = | <input type="text"/> |
| 5) | 0.5 | x | 160 | = | <input type="text"/> |
| 6) | 3.2 | ÷ | 2 | = | <input type="text"/> |
| 7) | $\frac{1}{2}$ | of | 3.2 | = | <input type="text"/> |
| 8) | 50% | of | 3.2 | = | <input type="text"/> |
| 9) | $\frac{3.2}{2}$ | | | = | <input type="text"/> |
| 10) | 0.5 | x | 3.2 | = | <input type="text"/> |

Name:

Date:

Mental Math – *Design your own*

Set A

- | | | | | |
|-----|---|-----|---|----------------------|
| 1) | x | 2 | = | <input type="text"/> |
| 2) | x | 5 | = | <input type="text"/> |
| 3) | x | 10 | = | <input type="text"/> |
| 4) | x | 2 | = | <input type="text"/> |
| 5) | x | 5 | = | <input type="text"/> |
| 6) | x | 10 | = | <input type="text"/> |
| 7) | x | 10 | = | <input type="text"/> |
| 8) | x | 5 | = | <input type="text"/> |
| 9) | x | 2 | = | <input type="text"/> |
| 10) | x | 100 | = | <input type="text"/> |

Set B

- | | | | | |
|-----|---|----|---|----------------------|
| 1) | x | 3 | = | <input type="text"/> |
| 2) | x | 4 | = | <input type="text"/> |
| 3) | x | 9 | = | <input type="text"/> |
| 4) | x | 12 | = | <input type="text"/> |
| 5) | x | 3 | = | <input type="text"/> |
| 6) | x | 4 | = | <input type="text"/> |
| 7) | x | 9 | = | <input type="text"/> |
| 8) | x | 12 | = | <input type="text"/> |
| 9) | x | 3 | = | <input type="text"/> |
| 10) | x | 4 | = | <input type="text"/> |

Set C

- | | | | | | |
|-----|----------------|-----------------|----|---|----------------------|
| 1) | | ÷ | 10 | = | <input type="text"/> |
| 2) | $\frac{1}{10}$ | of | | = | <input type="text"/> |
| 3) | 10% | of | | = | <input type="text"/> |
| 4) | | $\frac{30}{10}$ | | = | <input type="text"/> |
| 5) | 0.1 | x | | = | <input type="text"/> |
| 6) | | ÷ | 10 | = | <input type="text"/> |
| 7) | $\frac{1}{10}$ | of | | = | <input type="text"/> |
| 8) | 10% | of | | = | <input type="text"/> |
| 9) | | $\frac{54}{10}$ | | = | <input type="text"/> |
| 10) | 0.1 | x | | = | <input type="text"/> |

Set D

- | | | | | | |
|-----|---------------|-----------------|---|---|----------------------|
| 1) | | ÷ | 2 | = | <input type="text"/> |
| 2) | $\frac{1}{2}$ | of | | = | <input type="text"/> |
| 3) | 50% | of | | = | <input type="text"/> |
| 4) | | $\frac{160}{2}$ | | = | <input type="text"/> |
| 5) | 0.5 | x | | = | <input type="text"/> |
| 6) | | ÷ | 2 | = | <input type="text"/> |
| 7) | $\frac{1}{2}$ | of | | = | <input type="text"/> |
| 8) | 50% | of | | = | <input type="text"/> |
| 9) | | $\frac{3.2}{2}$ | | = | <input type="text"/> |
| 10) | 0.5 | x | | = | <input type="text"/> |

Computation and Numerical Estimation – Review 6-1-09

Question 9, Form 1, Level D

Marcie owns a hot dog stand. One week she sold 415 hot dogs for \$2.59 each. About how much money did she receive for these hot dogs?

- | | |
|----------|-----------------------------|
| A | Between \$800 and \$1,000 |
| B | Between \$1,000 and \$1,200 |
| C | Between \$1,200 and \$1,400 |
| D | Between \$1,400 and \$1,600 |

Reading the Question – Key Word

About how much

The Fundamental Concepts

Estimation involves rounding: 161 can be rounded to 150

The work “of” can be used as a word to replace the multiplication operation

$\frac{1}{3}$ is the same as dividing by 3

(Similarly, $\frac{1}{2}$ is the same as dividing by 2, $\frac{1}{4}$ is the same as dividing by 4)

Re-writing the question

$$\frac{1}{3} \times 161 = \frac{1}{3} \text{ of } 150, \text{ that is } 150 \div 3$$

Answer is 50, which will be an under-estimate as 150 is smaller than 161

Under or Over Estimation

When choosing the correct multiple choice response, consider if your estimate is an under or over estimation.

Further Practice

Do similar questions.

Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

Probability – Review 6-1-28

Question 29, Level D, Form 1

The chocolates in this box all look the same, but only 3 have almonds inside. If Mary Yamato choose one chocolate, what is the probability it will have almonds inside?



F $\frac{1}{3}$	H $\frac{1}{9}$
G $\frac{1}{4}$	J $\frac{1}{12}$

Reading the Question – Key Word

Only 3 have almonds inside

The Fundamental Concepts

$$\text{Probability} = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}} \quad \frac{3}{2} \quad \frac{1}{4}$$

Further Practice

Do similar questions.

Do Probability experiments with dice, spinner, and drawing items from a bag.

Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

Geometry and Spatial Sense – Review 6-1-30

Question 30, Level D, Form 1

Which of these types of quadrilateral can have exactly two right angles?

F	square
G	rectangle
H	trapezoid
J	parallelogram

Reading the Question – Key Word

Exactly 2 right angles

The Fundamental Concepts

Right angle is 90 degrees

Strategy

Eliminate incorrect responses

Square has 4 right angles

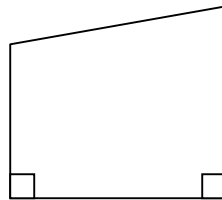
Rectangle has 4 right angles

So must be parallelogram or trapezoid

A parallelogram is eliminated as if it has even one right angle it would be turned into a rectangle.

So the answer must be a trapezoid.

It could look like:



Further Practice

“What shape am I”

Consider the minimum characteristics need to draw a shape

Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

What Shape am I?

Use the list of hints to work out the name of the shapes.
At each step, write down the possible options.

1.		
a.	I have 3 sides.	
b.	I have 2 sides the same length.	
c.	I have one obtuse angle.	
	Draw me	
	Name me	

2.		
a.	I have 4 sides.	
b.	I have 2 pairs of parallel sides	
c.	I have 4 equal sides	
	Draw me	
	What is my name?	

3.		
a.	I have at least 3 sides	
b.	All my sides are the same length	
c.	My internal angles add up to 540°	
	Draw me	
	What is my name?	

Make a card game, by putting the hint on one side and the answer (words and diagrams) on the other side. See the following example.

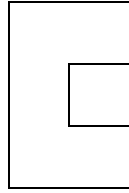
<p>What am I?</p> <p>I have 3 sides. Draw me.</p>	<p>What am I?</p> <p>I have 3 sides. I have 2 sides the same length. What is my name?</p>
--	--

<p>What am I? I have 3 sides. I have 2 sides the same length I have one obtuse angle. Draw me What is my name?</p>	<p>What am I? <i>I have 4 sides.</i> Draw me. What is my name?</p>
<p>What am I? I have 4 sides. I have 2 pairs of parallel sides. Draw me</p>	<p>What am I? I have 4 sides I have 2 pairs of parallel sides <i>I have 4 equal sides</i> What is my name?</p>
<p>What am I? I have 5 sides Draw me.</p>	<p>What am I? I have 5 sides. All my sides are the same length What is my name?</p>
<p>What am I? I have at least 3 sides. All my sides are the same length My internal angles add up to 540° Draw me What is my name?</p>	

Make your own “What am I?” card game? OR
Make your own game of “Polygon Concentration”

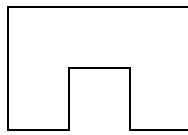
Geometry and Spatial - Review 6-1-32

Question 32, Level D, Form 1

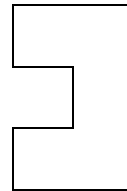


What will this figure look like after it is rotated 90° clockwise?

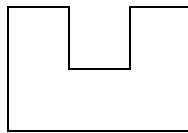
F



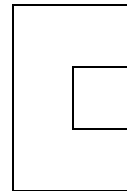
H



G



J



Reading the Question – Key Words

rotated 90° clockwise

The Fundamental Concepts

Clockwise

Rotate means to turn

Further Practice

Cut and paste shape then practice flips, slides and turns.

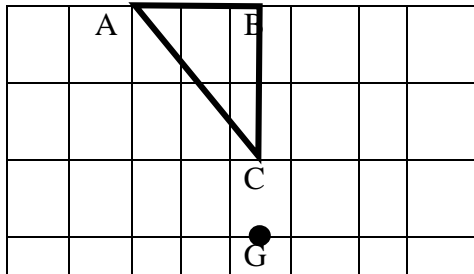
See “Transformations on the Cartesian Grids?”

Follow-up task

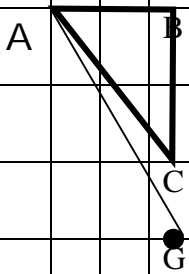
1. Write your own question like the one above
2. Complete the question and explain what you are doing. (next to or under your working)

Example

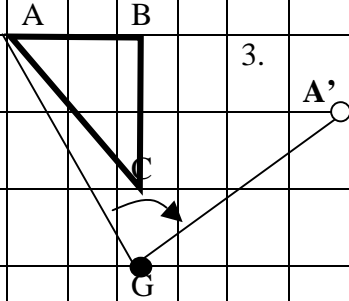
Rotate triangle ABC 90° clockwise about the point G



1.



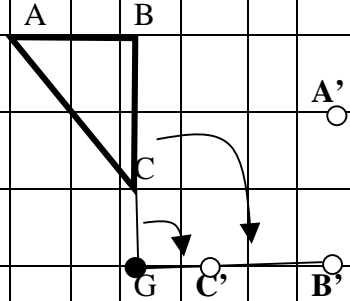
2.



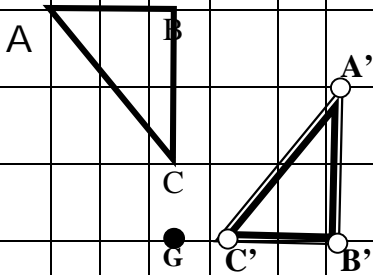
3.



4.



5.



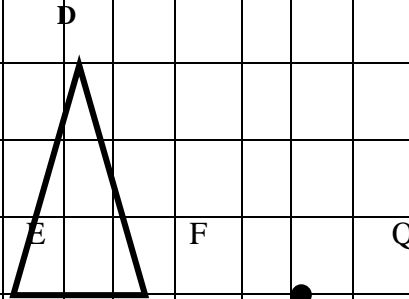
ROTATION

To rotate a shape about a point:

1. Draw a line to one of the corners (vertices) of the shape from the axis of rotation
2. Rotate that line the amount of turn required
3. Mark the point's "new" position
4. Repeat for the other points
5. Join the points to form the new position of the shape.

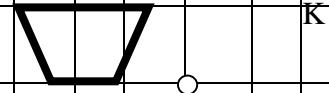
PROBLEM 1

Rotate the triangle DEF 180° clockwise about the point Q.

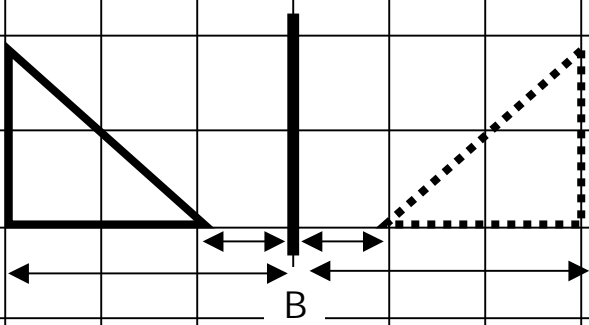


PROBLEM 2

Rotate the shape 90° anti-clockwise about the point K.

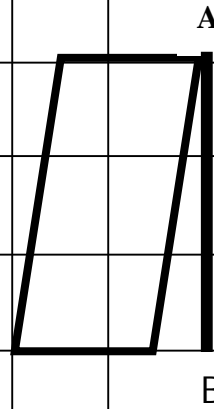
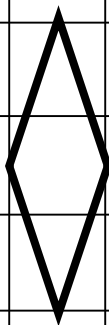
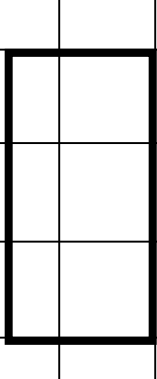


REFLECTION is "flipping" or producing "like a mirror image"

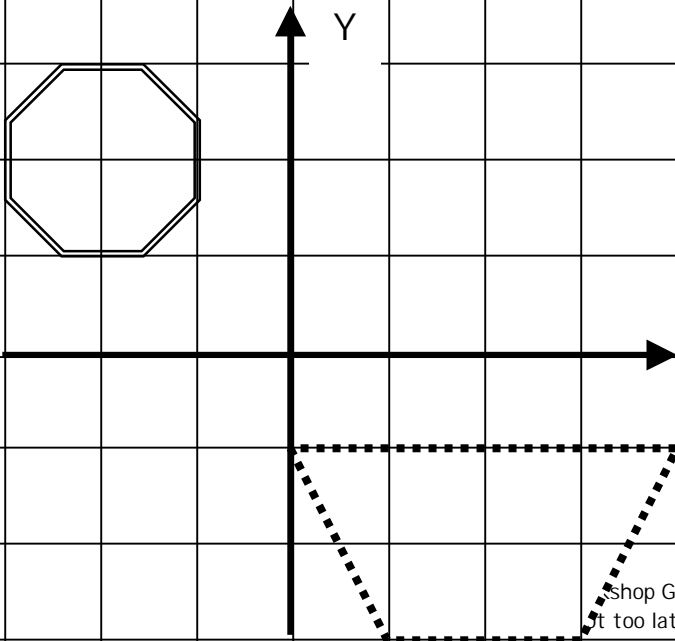


The triangle on the left has been reflected in the line AB. Note how the distance of each corner is the same distance as its "reflected corner" from the reflection line AB.

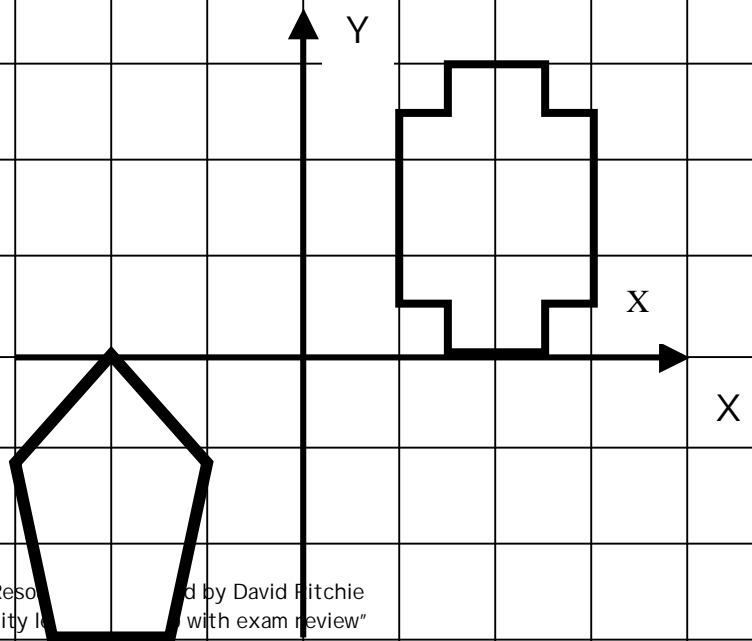
1. Reflect the shapes below in the mirror lines AB



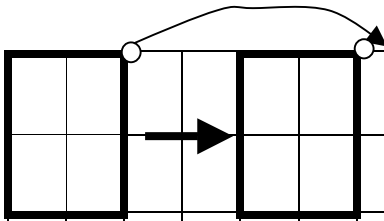
2. Reflect these shapes in the X axis



3. Reflect these shapes in the Y axis



WHAT ARE THE COORDINATES OF THE VERTICES OF THE REFLECTED SHAPES IN Qs 2 and 3?



TRANSLATION #1

is sliding...

The rectangle has been translated 4 units to the right.

Now continue to translate the rectangle according to the following directions:

Translate 5 units to the right ..then..

Translate 3 units down

Translate 7 units to the left

Translate 4 units down

Translate 6 units to the right

Translate 4 units down

Translate 8 units to the left

Translate 11 units down

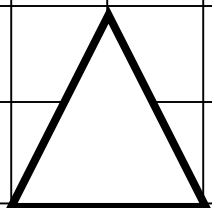
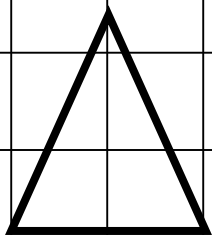
And finally...

Translate 14 units to the right.

Color in the rectangle in its final position.

Translation Activity #2

1. Without showing your partner, perform several translations (between 6 and 10) on the shape below. You cannot move the shape below the dotted line.
2. Write down in words for each successive translation in the space below.
3. Cut the paper on the dotted line
4. Give the instructions on the bottom half of the paper to your partner and see if they can follow the instructions accurately



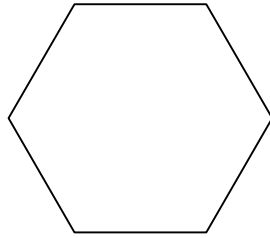
Instructions:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Geometry and Spatial Sense – Review 6-1-36

Question 36, Level D, Form 1

Mai Ling is going to draw all the lines of symmetry on this regular hexagon.



This will divide the hexagon into

F	6 congruent triangles
G	6 congruent quadrilaterals
H	12 congruent triangles
J	12 congruent quadrilaterals

Reading the Question – Key Word

Lines of symmetry, will divide hexagon into

The Fundamental Concepts

Line of symmetry is a fold/flip/mirror line

Strategy

Draw the lines of symmetry on the diagram

Further Practice

Draw and cut different polygons. Fold them in half to investigate the number of axes of symmetry.

Follow-up task

1. Write your own question like the one above
2. Do the question and explain what you are doing. (next to or under your working)

Making Polygons

1. Calculate the angle at the center of the polygon

(360 divided by the number of sides in the polygon)
(For example: if you are doing a Hexagon, 6 sides, you do $360/6 = 60^\circ$)

2. Work out how often you will mark around the Mathomat protractor by counting in multiples of the angle in 1.

For example: If the answer to 1. is 60° then you will mark $0^\circ, 60^\circ, 120^\circ, 180^\circ, 240^\circ, 300^\circ, 360^\circ$ (that is, going up by 60°)

3. Use the 360° protractor on the Mathomat, and mark around the circle.

4. Draw lines from the center point through the marked points to the edge of the page.

<i>For a regular shape</i>	<i>For an irregular shape</i>
Measure the same distance from the center along each line and mark a point.	Measure different distances from the center along each line and mark a point.
Join these points to make the polygon.	Join these points to make the polygon.

5. Fold along the axes of symmetry (fold or mirror lines)

Number and Number Relations – Review 6-1-41

Question 41, Form 1, Level D	
Charlie's cactus plant grew 8 inches in 5 months. At this rate, how many inches will it grow in 12 months?	
A	15 inches
B	19.2 inches
C	22 inches
D	28.2 inches

Reading the Question – Key Word

8 inches in 5 months at this rate How many inches in 12 months

Traditional Approach

The traditional approach is the set up a proportion and solve. For some students this is still a mystery especially the setting up of the proportion.

Alternative Approach

I like it better doing it as sentences similar to a table of equivalences with exact calculations or estimates. **REMEMBER:** An approximation is often all that is needed to make correct multiple choice selection.

Estimation approach

8 inches in 5 months

multiply by 2

16 inches in 10 months (*so answer is bigger than 16*)

need to get closer to 12 months, need 2 more months

divide original by 2

4 inches in 2.5 months

add

20 inches in 12.5 months (*answer must be smaller than 20 inches*)

So answer is 19.2 inches

Exact calculation approach (without a proportion, more unit rate)

8 inches in 5 months

divide by 5

1.6 inches in 1 month

multiply by 12

19.2 inches in 12 months

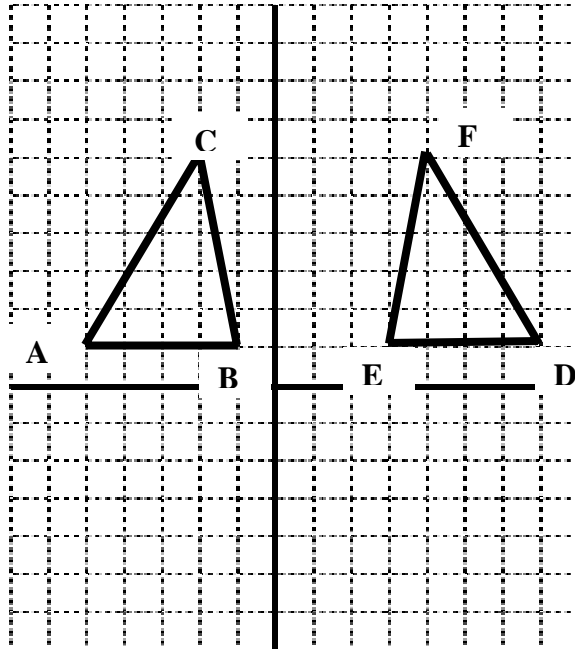
Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working).

Geometry and Spatial Sense – Review 6-2-45

Question 45, Level D, Form 2

Look at the figures on this coordinate grid.



Scale: 1 square = 1 unit

What directions would move $\triangle ABC$ to coincide with $\triangle DEF$?

A	Slide $\triangle ABC$ 8 units to the right
B	Reflect $\triangle ABC$ across the y-axis
C	Slide $\triangle ABC$ 2 units to the right, then reflect it across the y-axis
D	Reflect $\triangle ABC$ across the y-axis, then slide it 2 units to the right

The Fundamental Concept

Rotate means turn

Reflect means flip

Translate means slide

Practice Questions

See the following pages, "Transformation Triangles 1 to 4"

There is a blank page for creating new questions.

Remember to also explore transforming quadrilaterals and polygons.

Follow-up task

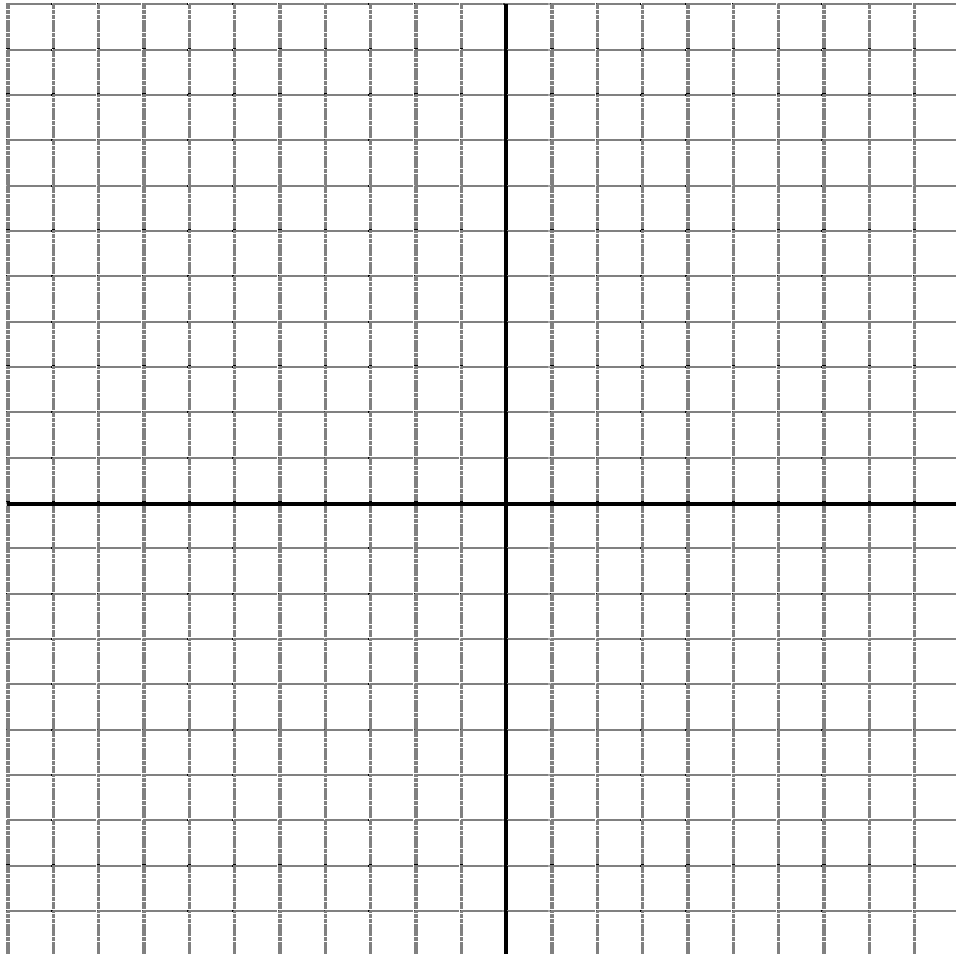
1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

Name:

Date:

Transformations – Triangles 1

1. On the graph below, plot and connect the points A(2,2), B(3,9) and C(6,4).



2. Translate (shift) the new triangle down 11 units.

What are the positions of the new points?

$A'(\quad , \quad), B'(\quad , \quad), C'(\quad , \quad)$

3. Translate (shift) the new triangle left 8 units.

What are the positions of the new points?

$A''(\quad , \quad), B''(\quad , \quad), C''(\quad , \quad)$

4. Translate (shift) the new triangle up 11 units

What are the positions of the new points?

$A'''(\quad , \quad), B'''(\quad , \quad), C'''(\quad , \quad)$

What transformation is needed to get the triangle back to its original position?

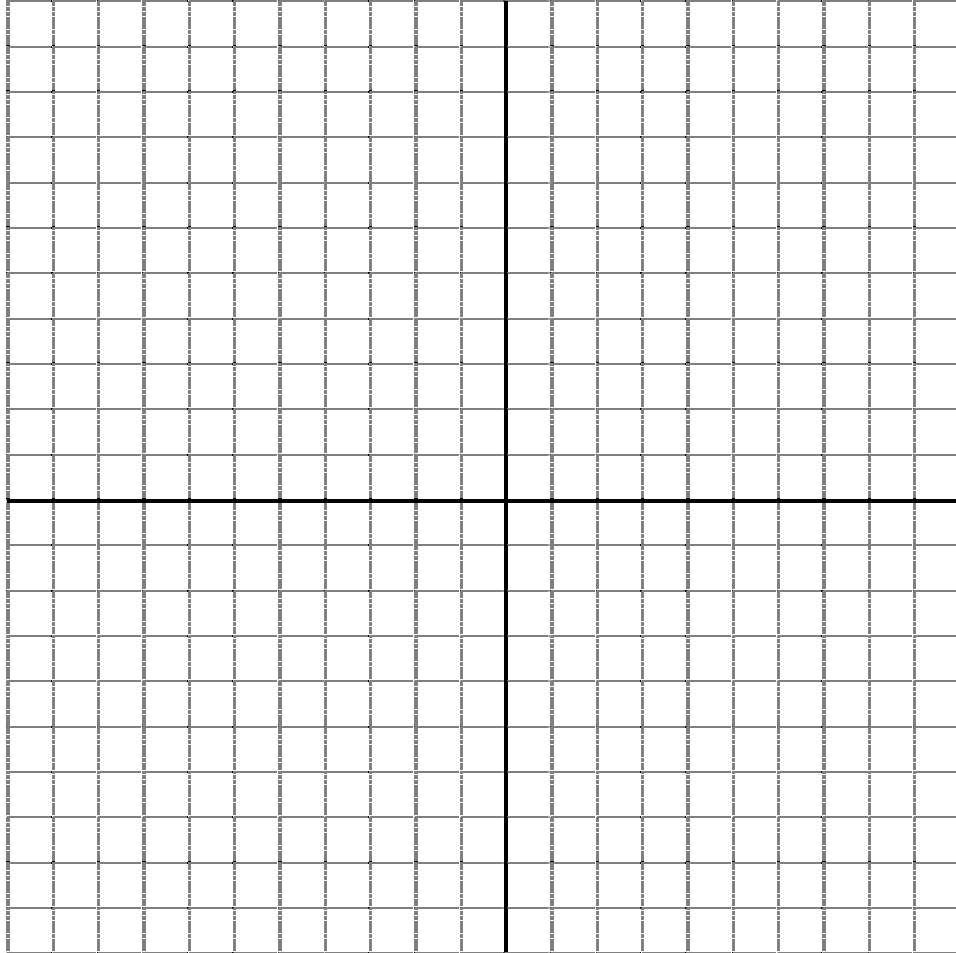
Follow-up activity: Design a similar question sheet.

Name:

Date:

Transformations – Triangles 2

1. On the graph below, plot and connect the points A(2,2), B(3,9) and C(6,4).



2. Reflect (flip) the triangle about the y-axis. What are the positions of the points?
 $A'(\quad , \quad), B'(\quad , \quad), C'(\quad , \quad)$
3. Next, Reflect (flip) the triangle about the x-axis. What are the positions of the new points?
 $A''(\quad , \quad), B''(\quad , \quad), C''(\quad , \quad)$
4. Now, Reflect (flip) Reflect (flip) the triangle about the y-axis about the y-axis. What are the positions of the new points?
 $A'''(\quad , \quad), B'''(\quad , \quad), C'''(\quad , \quad)$
What transformation do you have to do to get the triangle back to its original position?

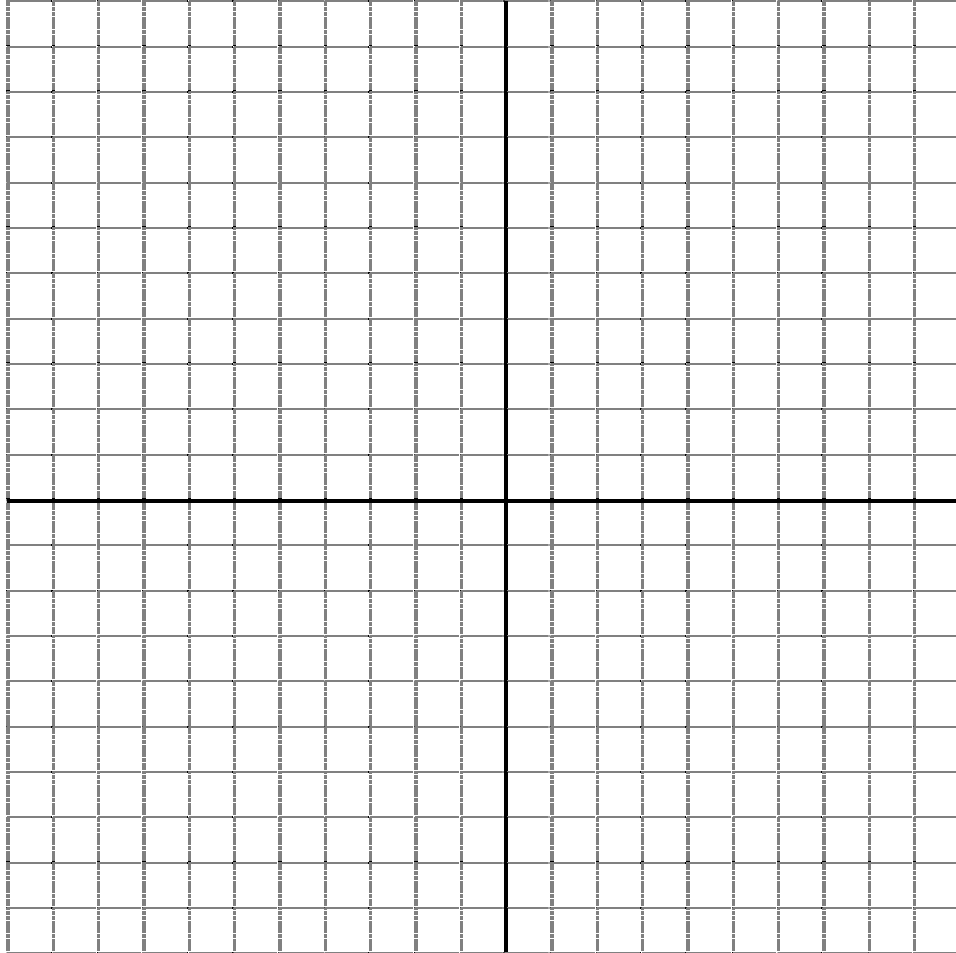
Follow-up activity: Design a similar question sheet.

Name:

Date:

Transformations – Triangles 3

1. On the graph below, plot and connect the points A(2,2), B(3,9) and C(6,4).



2. Rotate (turn) the triangle 90° clockwise about the origin (0, 0). What are the positions of the points?

$A'(\quad , \quad), B'(\quad , \quad), C'(\quad , \quad)$

What do you notice about the x and y values of the points?

3. Next, rotate (turn) the triangle 180° clockwise about the origin (0, 0). What are the positions of the points?

$A''(\quad , \quad), B''(\quad , \quad), C''(\quad , \quad)$

What do you notice about the x and y values of the points?

What transformation is needed to get the triangle back to its original position?

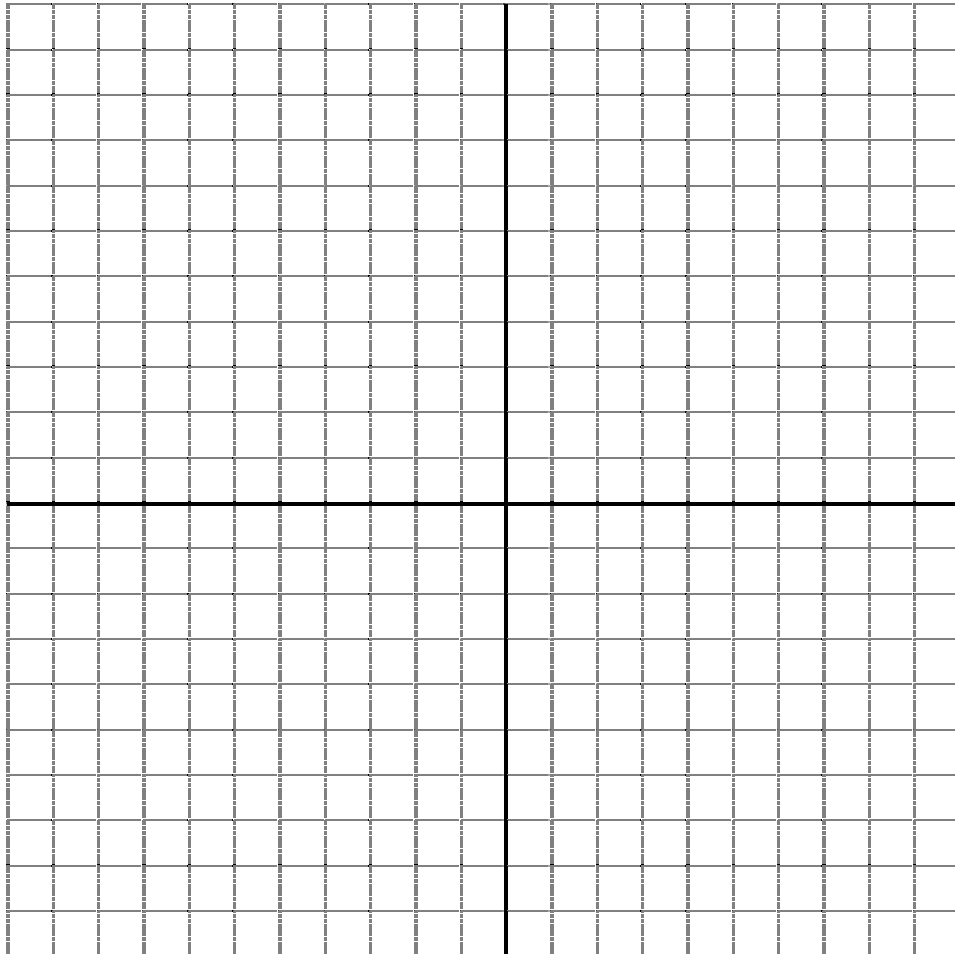
Follow-up activity: Design a similar question sheet.

Name:

Date:

Transformations – Triangles 4

1. On the graph below, plot and connect the points A(2,2), B(3,9) and C(6,4).



2. Reflect (flip) the triangle about the y-axis. What are the positions of the points?

$A'(\quad , \quad), B'(\quad , \quad), C'(\quad , \quad)$

3. Next, translate (shift) the new triangle down 11 units. What are the positions of the new points?

$A''(\quad , \quad), B''(\quad , \quad), C''(\quad , \quad)$

4. Now, multiply all the x-coordinates by -1 . What are the positions of the new points?

$A'''(\quad , \quad), B'''(\quad , \quad), C'''(\quad , \quad)$

Is there another of describing the last transformation?

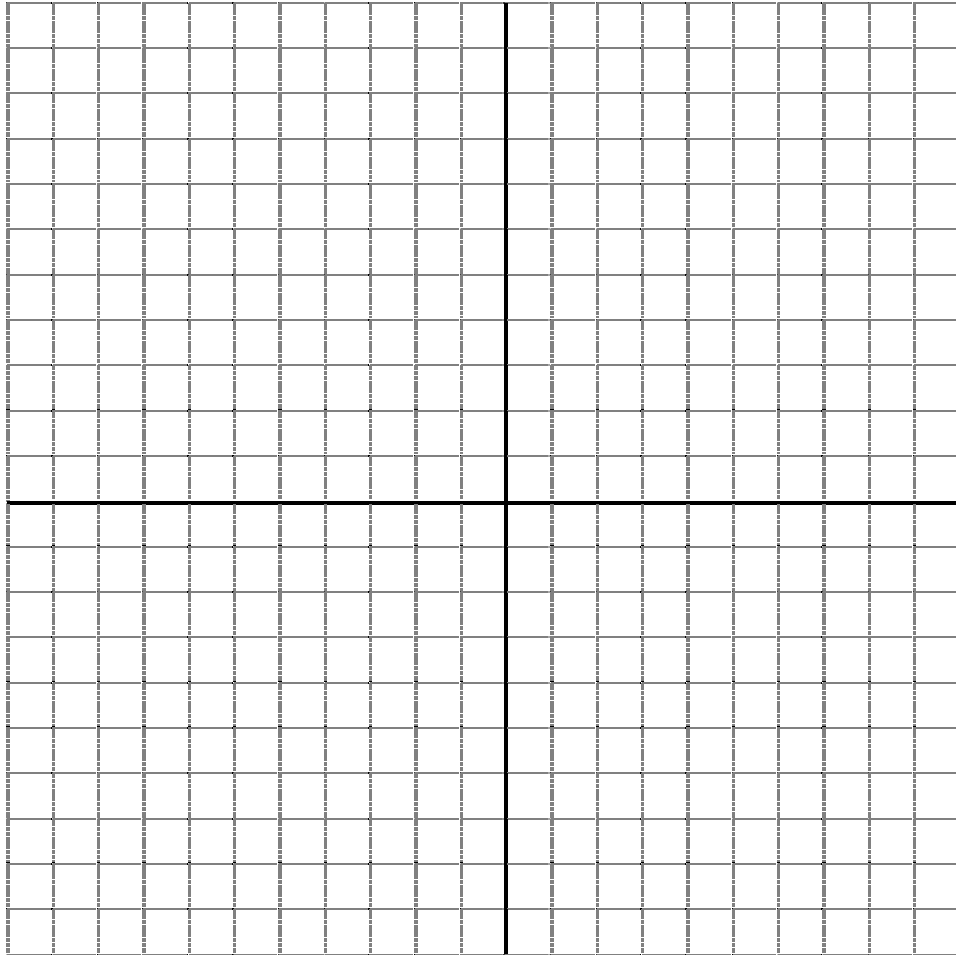
Follow-up activity: Design a similar question sheet.

Designer's Name:
Tester's Name:

Date:
Date:

Transformations – Design your own

1. On the graph below, plot and connect the points



2.

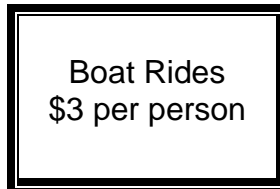
3.

4.

Patterns Functions Algebra – Review 6-2-46

Question 46, Level D, Form 2

Use this sign to answer the questions below.



The members of the bird-watching club took the boat to an island. They paid \$192 all together for the boat ride. If there are 6 more women than men in the group, how many women are there?

F 35

G 38

H 70

J 99

Reading the Question – Key Words

\$3 per person

\$192 paid

6 more women than men

How many women are there?

Steps to solving the question

1st step: Need to work out how many people so $192 \div 3 = 64$

2nd step: Work out how many men and women.

The Traditional and Alternative Approaches

Many teachers model an algebraic approach to this type of question.

Many students given some coaching can develop good skills in doing “Guess and Check”

As a teacher you should model for the students how to organize their information in a table of values.

Here are 2 approaches

Approach 1 – split the players equally and then “Test and Review”

Women	Men	Thoughts
32	32	Split equally. Women need more
38	26	Too many women, 12 more, only need 6 more.
35	29	6 more women than men

Approach 2 – take the excess of the total and divide the remaining players equally.

Women	Men	Thoughts
6 more women		Total of 64
		If there are 6 more women than men, each share 58.
29	29	Each have half of 58
35	29	Total for each group

Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

Other Questions

Question 35, Level E, Form 1

The field hockey team at a middle school has 12 more players than the softball team. The two teams have a total of 80 players. How many players are there on the softball team?

A 28

B 34

C 52

D 68

Question 15, Level E, Form 2

Mrs Snyder owns a car wash.

The car wash offers a choice of Regular Wash or Deluxe Wash. One day there was a total of 110 customers. The number of customers who chose Regular Wash was 24 more than the number who chose Deluxe Wash. How many customers chose Regular Wash that day?

A 67

B 71

C 79

D 86

Question 44, Level F, Form 1

A total of 1,060 people attended two performances of the school play. At the first performance there were 120 more people than at the second performance. How many people attended the first performance?

F 470

G 590

H 650

J 940