

Math 246 Final exam review outline:

From quiz review 1: There are likely to be a few questions about sets.

- Some of them will be sets of geometric objects (see the recent shape sorting assignment).
- A few questions (1-3) will be of the sort on the first page of the first quiz review: example sets, problem solving about set names or set puzzles.
- I do not plan to include questions like those on the second page of the quiz review (sentences, Venn diagrams and notation).

From test review 1 (patterns and functions): There will be some problems about patterns and functions

- There will probably be a problem where you need to find a formula for a pattern and explain why it makes sense.
- There will probably be a problem about a pattern where you need to work backwards using a formula (see problems 3 and 4 on the review).
- There may also be problems where you need to graph a pattern or do a calculation using the correct order of operations.

From quiz review 2 (operations concepts):

- You will need to be able to draw bar diagrams for word problems
- You will need to be able to explain and draw diagrams to show the direct modeling strategies: joining all, joining to, separate, compare (addition and subtraction), repeated sets (multiplication), partition division (dealing) and measurement division (make sets).
- Write a word problem of a given type
- You may be asked to compare two word problems by problem type to decide which is more difficult.

From test review 2 (operations algorithms): There will be some questions on the final about operations and algorithms that are similar to those on the review sheet, including those that did not appear on the test. Types of problems from the review sheet are:

- Explain steps in the standard algorithm for addition or subtraction
- Show alternate ways of adding 2-digit numbers, including adding on and adding up to on the number line, adding in place values for addition, and the negative numbers algorithm for subtraction.
- Showing division both with the long division algorithm (standard) and scaffolding division (numerically and with manipulatives or set diagrams)
- Explaining the commutative and/or distributive laws.
- Draw diagrams for multiplication and compare them to the standard and expanded multiplication algorithms.
- Use equals signs correctly (note: points will be deducted for incorrect equals sign usage throughout the test).

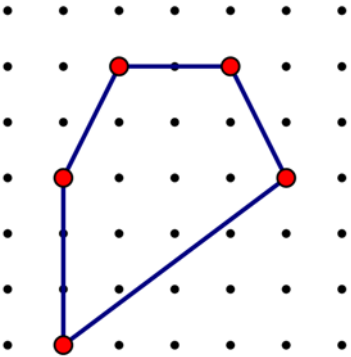
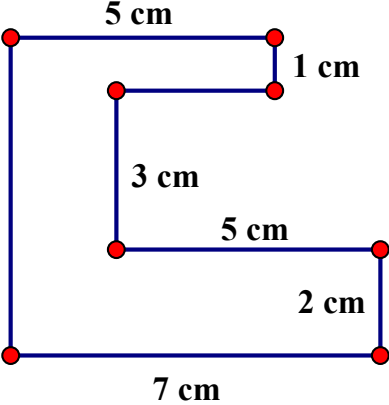
Area problems:

- Find the base and height of a triangle or parallelogram and use them to find the area (on a grid).
- Find the area of a shape using a unit square counting strategy
- Find the area of a shape by adding up areas of smaller shapes (well labelled)
- Find the area of a shape by subtracting from a larger shape (well labelled)
- Show equal area parallelograms and triangles
- Draw a height line for a triangle or parallelogram (not on a grid)
- Explain how the area of a triangle formula is derived (from a parallelogram) or how the area of a parallelogram formula is derived (from a rectangle)

More geometry problems, sample problems

Perimeter:

Find the perimeters. Show how you figured out the side lengths in an organized way:

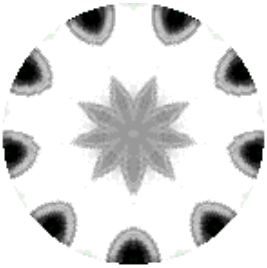
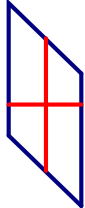

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Classifying Shapes:

3. Draw a Venn diagram showing the relationship between a rectangles, rhombuses, and squares in the universe of quadrilaterals. Draw a picture of something that belongs in each non-empty region.
4. Draw a Venn diagram showing the relationship between isosceles triangles and acute triangles in the universe of triangles. Draw a shape that belongs in each non-empty region.
5. Draw a Venn diagram showing the relationship between regular polygons and concave polygons in the universe of polygons. Draw a shape that belongs in each non-empty region.
6. Choose two types of special quadrilaterals (parallelogram, rectangle, square, rhombus, kite or trapezoid) that have a set-subset relationship, and draw a Venn diagram where the universe is. Draw example shapes.

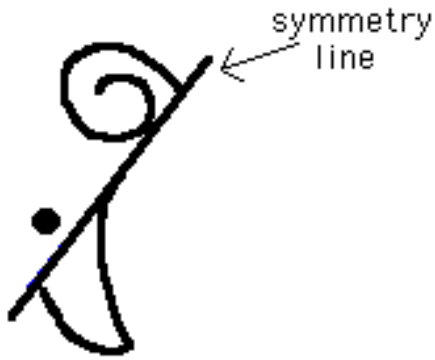
Symmetry:

7. Draw in all of the symmetry lines, and find and show the angle of rotation symmetry for each of the following:

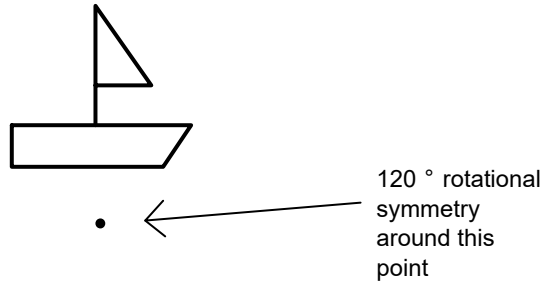
<p>A.</p> 	<p>B.</p> 	<p>C.</p> 
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8. Complete the pattern so that it has reflection or rotational symmetry as specified:

A.

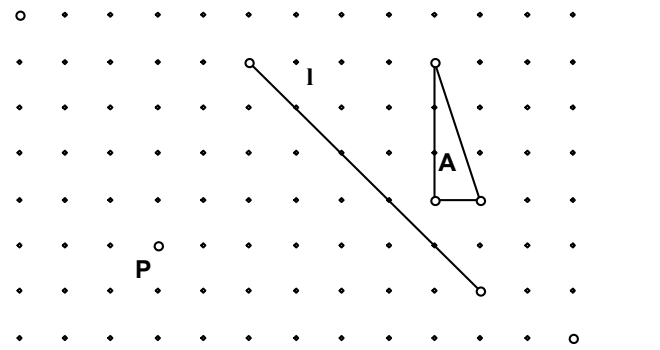


B.

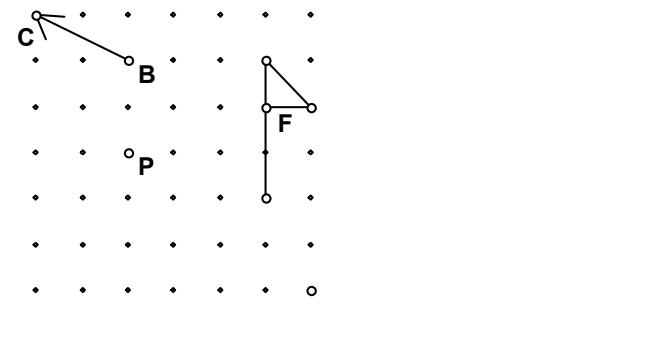


Transformations:

9. Show with a dotted line, the image of triangle A after reflection in line l, and then show with a solid line, where the reflected triangle would be after being rotated by 90° counterclockwise around point P:



10. Show with a dotted line, the image of flag F after translating along the vector from B to C and then show with a solid line, where the translated flag would be after being rotated by 180° around point P:



11. Tell how to get from trapezoid A to trapezoid B using 3 or fewer transformations:

