Math 3, Classwork 7

WARM-UP

1. Compare expressions (<, >, =):

$7 \times 5 \ldots 6 \times 8$ $\qquad$ $12 + 12 + 12 \ldots 12 \times 4$

$3 \times 9 \ldots 5 \times 5$ $\qquad$ $4 \times 6 \ldots\ 3 \times 8$

2. Arrange the following expressions in decreasing order (without calculating their values):

75 -19 $\qquad$ 65 - 49 $\qquad$ 65 - 29 $\qquad$ 75 - 29 $\qquad$ 65 - 39

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3. Find all pairs of numbers, such that their product is:

a) 20 ______________________

b) 30 ______________________

c) 40 ______________________

4. Solve equations and check your answer:

a) $14 + x = 26$ $\qquad$ b) $x - 18 = 33$ $\qquad$ c) $89 - a = 71$

__________ $\qquad$ __________ $\qquad$ __________

__________ $\qquad$ __________ $\qquad$ __________

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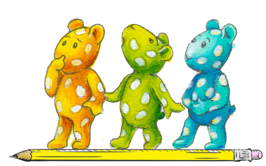
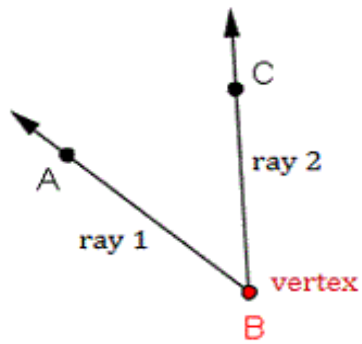
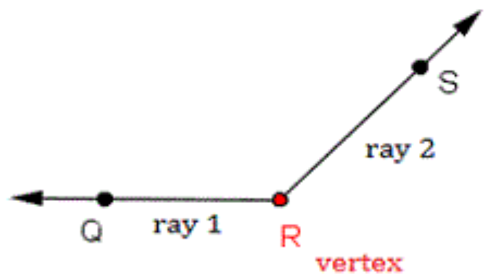


REVIEW I

An angle is formed when two rays meet at a common endpoint. The rays are called the ***sides*** of the angle and their common point is called the ***vertex*** of the angle.

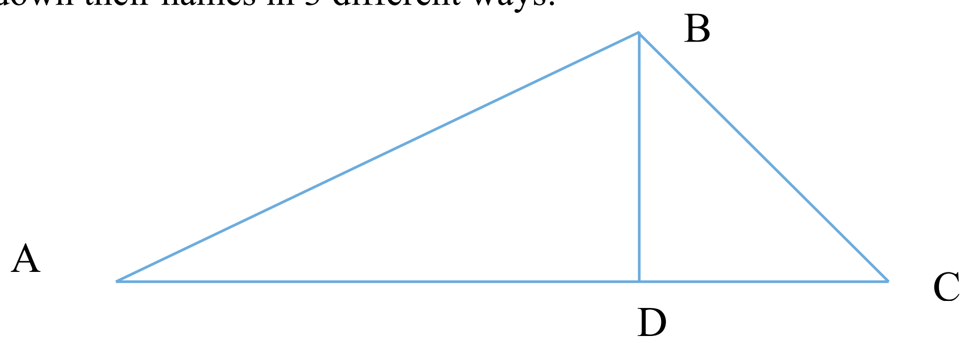




On the pictures above first angle is called the angle B and is denoted as **∠B** or **∠ABC** or **∠CBA** (the vertex is always in the middle). The angle ∠ABC is an acute angle.

The second angle is called the angle R and is denoted as **∠R, ∠QRC** or **∠CRQ**. This is an obtuse angle.

5. Using a right angle template, find all acute, obtuse and right angles in the figure below and write down their names in 3 different ways:



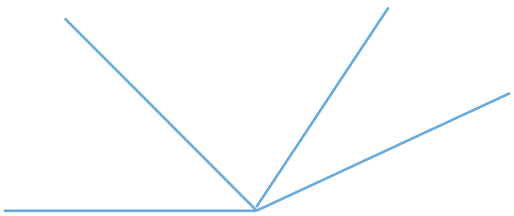
Acute: ______________________________

Obtuse: ______________________________

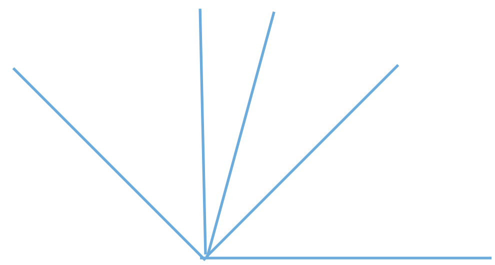
Right: ______________________________

6. How many angles do you see?

a)



b)



A triangle is a closed shape with three straight sides that meet at three vertices. It is a polygon.

Types of triangles

By sides: a) **Scalene triangle** – no equal angles and no equal sides

b) **Isosceles triangle** – 2 equal sides and 2 equal angles

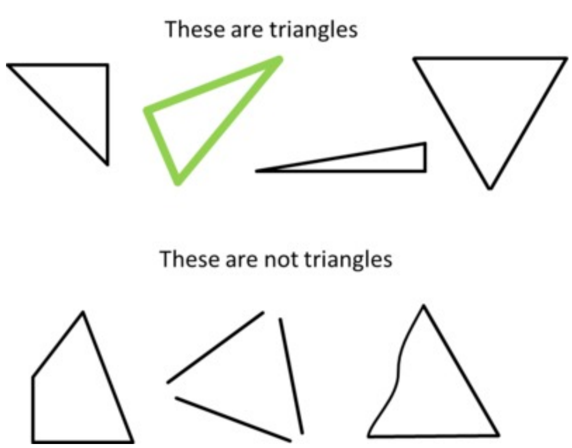
c) **Equilateral triangle** – 3 equal sides and 3 equal angles

By angles: a) **Right triangle**– has a right angle

b) **Obtuse triangle** – has an angle that larger than a right angle

c) **Acute triangle** – all angles are smaller than a right angle

Pay attention!



7. The side of an equilateral triangle is 8 cm. Find a perimeter of this triangle.

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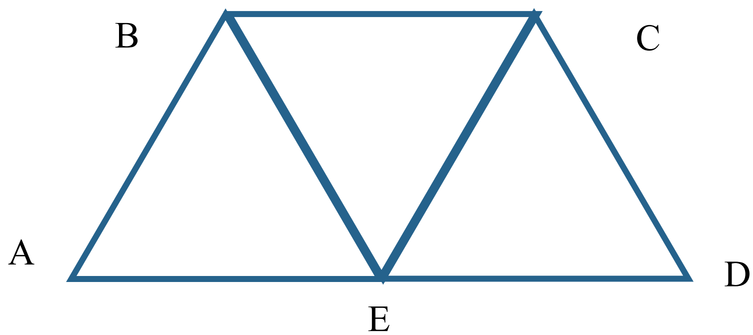
8. A quadrilateral consists of 3 equilateral triangles. The length of a side of each triangle is 6 cm. Find a perimeter of the quadrilateral. ______________________________



9. Choose two distinct points A and B on the plane.

a) For which points C is $\triangle ABC$ a right triangle?
b) For which points C is $\triangle ABC$ an obtuse triangle?
c) For which points C is $\triangle ABC$ an acute triangle?

REVIEW II

10. a) Make a list of the first ten multiples of 3.

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b) Which of the numbers in your list are multiples of 6? What pattern do you see in where the multiples of 6 appear in the list?

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c) Which numbers in the list are multiples of 7? Can you predict where multiples of 7 will appear in the list of multiples of 3? Explain your reasoning.

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11. Cora and Cecilia use chalk to make their own number patterns on the sidewalk. Cora puts 0 in her first box and decides that she will add 3 every time to get the next number. Cecilia puts 0 in her first box and decides that she will add 9 every time to get the next number.

Cora:

0	3								

Cecilia:

0	9								

a) Complete each girl's sidewalk pattern.
b) How many times greater is Cecilia's number in the 5th box than Cora's number in the 5th box? ________________

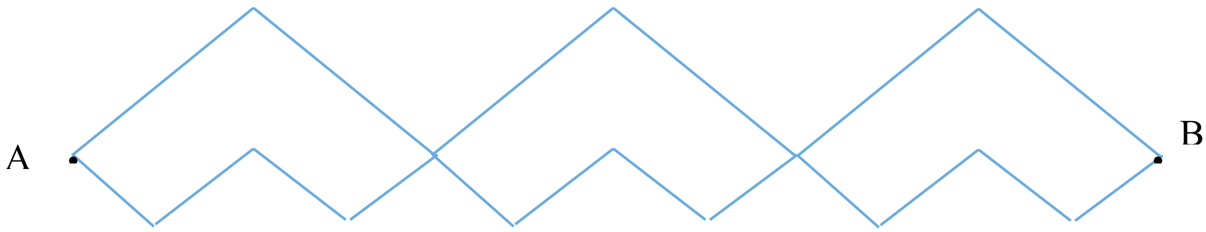
What about the numbers in the 8th box? ________________

In the 10th box? ______________________

c) What pattern do you notice in your answers for part b? Why do you think that pattern exists?
d) If Cora and Cecilia kept their sidewalk patterns going, what number would be in Cora's box when Cecilia's corresponding box shows 108? ______________

Challenge yourself

12. How many polygonal chains connect points A and B? Compare their lengths.



Did you know …

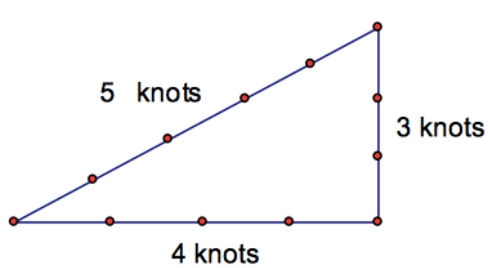
What's with all the Triangles? They seem to be everywhere. The Triangle has a rich and complex history and has, since early civilizations, been the symbol of the trilogy (or "triad") that makes all existence possible.

Triangles are among the most important objects studied in mathematics owing to the rich mathematical theory built up around them in **Euclidean geometry** and **trigonometry**, and also to their applicability in such areas as astronomy, architecture, engineering, physics, navigation, and surveying.

The origins of right triangle geometry can be traced back to 3000 BC in Ancient Egypt.

The Egyptians used special right triangles to survey land by measuring out 3-4-5 right triangles to make right angles. The Egyptians most studied specific examples of right triangles.

Ancient builders and surveyors needed to be able to construct right angles in the field on demand. The method employed by the Egyptians earned them the name "rope pullers" in Greece, apparently because they employed a rope for laying out their construction guidelines. One way that they could have employed a rope to construct right triangles was to mark a looped rope with knots so that, when held at the knots and pulled tight, the rope must form a right triangle.



The simplest way to perform the trick is to take a rope that is 12 units long, make knot 3 units from one end and another 5 units from the other end, and then knot the ends together to form a loop. Try to make one yourself.