Math 3 Classwork 11

Warm-Up

1 Write the missing numbers to make the equations correct:

$12 \times$ ___= ___ $\times 10$ ___ $\times$ 15= ___ $\times 10$

____ $\times 6 =$ ___ $\times 3$ ___ $\times 8 =$ ___ $\times 10$

___ $\times 2 =$___ $\times 4 =$ __ $\times 8$ ___ $\times 3 =$___ $\times 6 =$ __ $\times 9$

2 Complete the mixed addition and subtraction calculations (use the most optimal way)

51 – 42 + 49 = ___________________ 77 – 63 – 7 = ________________

63 + 12 – 25 = ___________________ 32 - 45 + 68 = ________________

3 Answer the questions (mental math):

a) How many threes should be subtracted from 15 so the result is 0?
b) How many forth should be subtracted from 24 so the result is 0?
c) Six tens are subtracted from the number and the result is 2. What is the number?
d) Eight threes are subtracted from the number and the result is 1. What is the number?

4 Solve the problems:

a) Dad works 8 hours a day, 5 days a week. How many hours a week does dad work? ________

b) Simon reads 6 pages of a book every day. He has been reading a book for 4 days. On the fifth day, Simon should start to read from a page _________?

Homework Review

5 Solve for *x:*

$(630 - x) + 210 = 500$ $(x + 190) - 370 = 330$

_________________________ _________________________

_________________________ _________________________

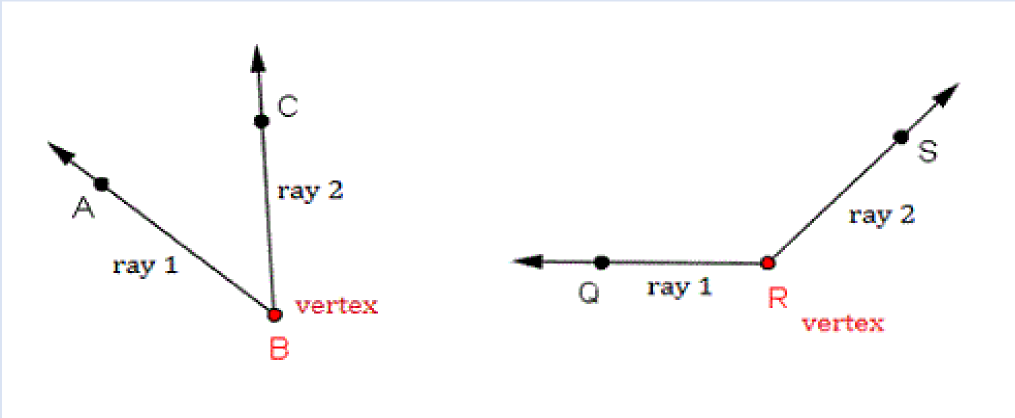
_________________________ _________________________

_________________________ _________________________

_________________________ _________________________

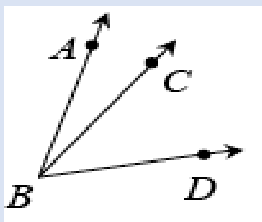
REVIEW

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.



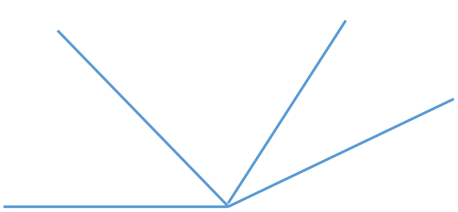
On the pictures above first angle is called the angle B and is denoted as **∠B** or **∠ABC** or **∠CBA** (the vertex is always in the middle). The angle ∠ABC is **an acute angle**.
The second angle is called the angle R and is denoted as **∠R, ∠QRC** or **∠CRQ**. This is an **obtuse angle.**

Adjacent angles: Two **angles** are **Adjacent** when they have a common side and a common vertex (corner point) and don't overlap. In the example at right, ∠ABC and ∠CBD are adjacent angles.

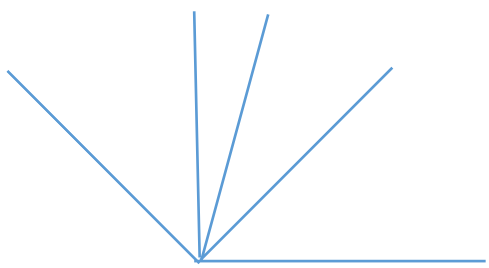


6 How many angles do you see?

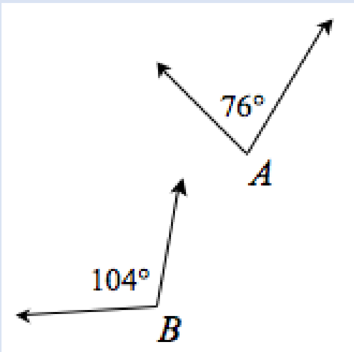
a)

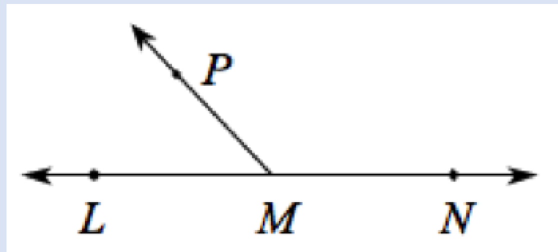


b)



Supplementary angles: Two angles A and B for which A + B = 180°. Each angle is called the supplement of the other. In the example at left, angles A and B are **supplementary**. Supplementary angles are often adjacent. For example, since ∠LMN is a straight angle, then ∠LMP and ∠PMN are supplementary angles because ∠LMP + ∠PMN = 180°.





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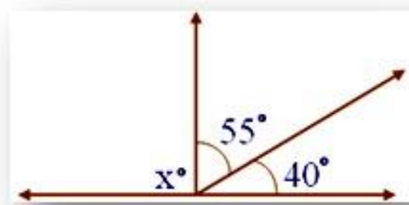
a) Verify if 115°, 65° are a pair of supplementary angles. ________________________

b) In the given figure find the measure of the unknown angle. __________________________



New Material

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

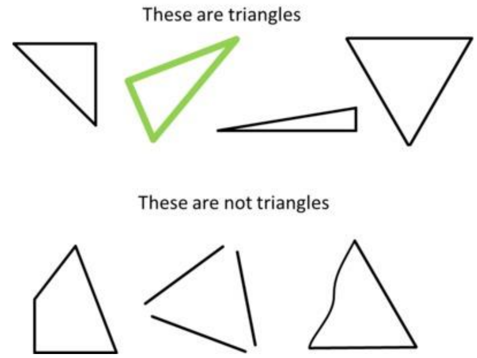
By angles:

a) **Right triangle**– has a right angle

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

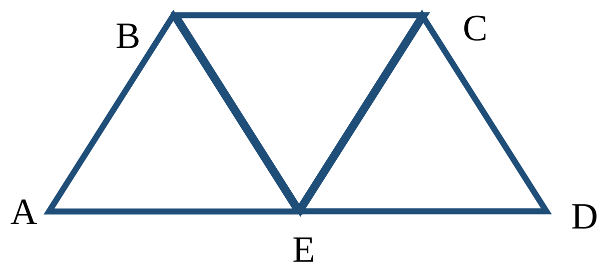
c) **Acute triangle** – all angles are smaller than a right angle

Pay attention!



8 The side of an equilateral triangle is 8 cm. Find a perimeter of this triangle.
P = ________________________

9 A quadrilateral consists of 3 equilateral triangles. The length of a side of each triangle is 6 cm. Find a perimeter of the quadrilateral. P = ___________________________



Why do we need parentheses?

When we have a math problem that involves more than one operation—for example, addition and subtraction, or subtraction and multiplication—which operation do you perform first?

Example: 8 – 4 + 1

If the operations are performed in the natural order:

1st - subtraction , then - addition, the answer will be 5.

In order to change the natural order, we use ***parentheses***. By inserting parentheses around the particular operation, we are saying that this particular operation should be performed first.

1 2
8 – 4 + 1 = 5

2 1
8 – (4 + 1) = 3

If there are several pairs of parentheses in the expression, we perform operations inside them from the left to right.

1 3 4 2
Example: (5 + 1) – 4 + (8 – 5)

How do we work with parentheses?

The part between two parentheses is treated like a SINGLE number.

Removing parentheses.

$a + (b + c) = a + b + c$

$a + (b - c) = a + b - c$

$a - (b + c) = a - b - c$

$a - (b - c) = a - b + c$

10 Open up the parentheses (be careful with a "– "sign in front of parentheses):

$(s + 3) + (4 + a) =$__________________ $(f + 4) - (g + 64) =$________________

$(n + b - d) + 14 =$__________________ $(20 - t) - (w + v) =$________________

11 Determine the order of operations in each expression (put the number of the operation above the operation sign):

a) a – (b + c) **b)** (a + b) – c **c)** a – (b – c) – d

d) 26 + (32 – 16) **e)** 93 + (12 + 16) – 35 **f)** a + (b – c + d)

12 Mark the order of operations and find the result:

18 + 12 – 8 – 6 = ______________ 32 – 10 + 6 – 3 = __________

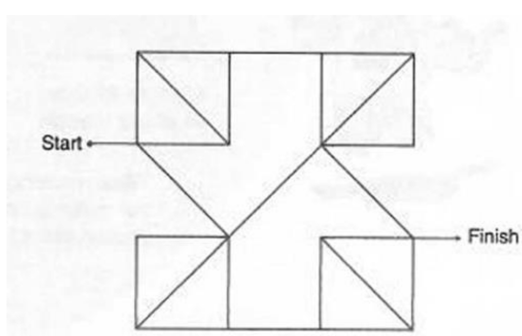
18 + 12 – (8 – 6) = __________ 32 – (10 + 6) – 3 = __________

18 + (12 – 8) – 6 = __________ 32 – 10 + (6 – 3) = __________

Challenge yourself

13 Complete each angle maze below by tracing a path from start to finish that has only acute angles. Be careful and avoid right angles in the 2nd maze.

a)



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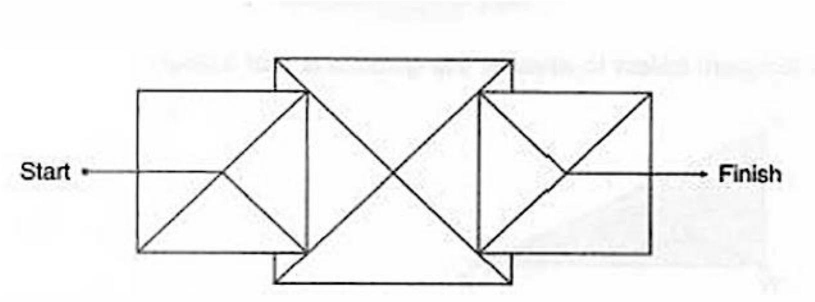

Did you know …

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.