# Math 3   Classwork 14

## Warm-Up

**1** Write the missing numbers to make the equations correct:

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

___ $\times 8 =$ ___ $\times 12$                    ___ $\times 6 =$ ___ $\times 3$

___ $\times 8 =$ ___ $\times 10$                    ___ $\times 2 =$ ___ $\times 4 =$ ___ $\times 8$

**2** Solve equations and check your answer:

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

_____          _____          _____

_____          _____          _____

_____          _____          _____

**3** Compare expressions ($<$, $>$, $=$):

$7 \times 5 \dots 6 \times 8$                    $12 + 12 + 12 \dots 12 \times 4$

$3 \times 9 \dots 5 \times 5$                    $4 \times 6 \dots 3 \times 8$

$5 \times 9 \dots 5 \times 5 + 5$                $10 \times 3 \dots 5 \times 5 + 5$

$3 \times 9 \dots 4 \times 7 + 2$                $15 + 15 + 15 \dots 10 \times 5 - 5$

**4** 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? _____

**5** Evaluate an expression $9 \times a + 3$ for each value of $a$:

$a = 9$                    $a = 5$                    $a = 20$

_____          _____          _____

**6** Simplify each expression below:

$a + 11 + 14 =$              $18 + b + 20 =$                    $c + 12 + c =$

$p + 10 - 50 =$              $18 + l - l =$                    $m + m + k + k =$

## New Material I

---

**Using a compass**

A compass is a handy drawing tool to have around. Use it to draw circles, make equal size line segments or find the midpoint of a line.

---

**8.** Use a compass to find a point A on the other side of the angle so that point A will be on the same distance from the vertex of the angle – B, as point C is.

•C

•B
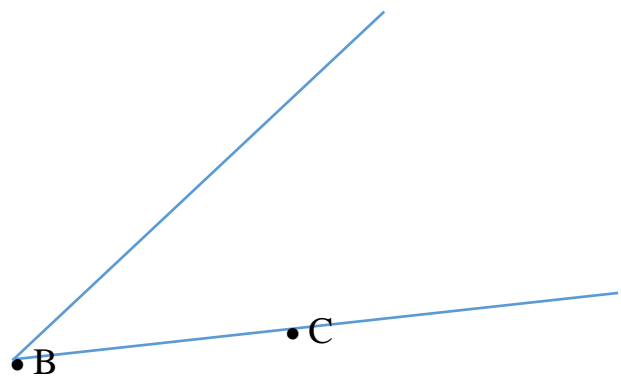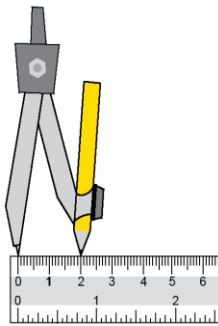
**9.** Use a compass and a straightedge (ruler) to construct a line segment which is
a) The sum of the segments *a* and *b*.

*b*

*a* ————————————

├————————————————————————┤
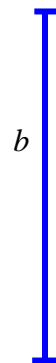
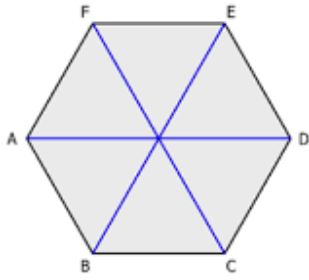b) The difference of those segments.

├————————————————————————┤

**Parallel and Perpendicular lines. Using compass for measuring distances. Long multiplication.**

**10**

Let's learn how to build a symmetrical hexagon using a compass and a straight edge only!



a)   Use a compass to draw a circle centered at a given point **A** and passing through another point **B** (choose your own compass opening).

b)   Place your compass with the same radius setting at the point **B** and make a mark on a circle on either side of point **B.** Mark this point with a letter **C**

c)   Place your compass with the same radius setting at the point **C** and make a mark on a circle going in the same direction as you did in step b). Mark this point with a letter **D.**

d)   Repeat step c) three more times or until you will come back to a point **B.**

e)   Take a straight edge and connect each point with two neighboring points.

f)   Using a straight edge connect each point with a center of your initial circle – point **A.**

● **A**

*Questions:* 1. If we set the distance between point A (center of the circle) and point B to be 1 unit, what is the distance AC? _____AD? _____.

2. What can you tell about the 6 angles, between segments connecting center of the circle A with points B, C, D, E, F, G – ∠ BAC, ∠ CAD, ∠ DAE, ∠ EAF, ∠ FAG and ∠ GAB?

3. Can you tell the measure of each angle in degrees, if we know that the full angle is 360°?

## New Material II

**Multiplying Bigger Numbers:**

When multiplying by two-digit number,
We can use a "partial products" method.

CALCULATE: 179 x 64

Here is the answer using the partial products algorithm:

Here is a rectangle with side lengths $100 + 70 + 9$ and $60 + 4$ that shows all the partial products as the area of part of the rectangle:

| | 100 | 70 | 9 |
|---|---|---|---|
| 60 | 60 x 100 = 6,000 | 60 x 70= 4,200 | 60 x 9 = 540 |
| 4 | 4 x 100= 400 | 4 x 70= 280 | 4 x 9 = 36 |

```
      179
    x  64
9 x 4 =        36
70 x 4 =      280
100 x 4 =     400
9 x 60 =      540
70 x 60 =    4200
100 x 60 = +6000
             11,456
```

```
   6,000
   4,200
     540
     400
     280
+     36
  11,456
```

Multiply:

**11**

$321 \times 22 =$        $482 \times 36 =$        $503 \times 84 =$