Lesson № 26

1 *Little Joe and Foxy Tail are picking carrots from their vegetable garden. They have planted and successfully grown 900 carrots. Little Joe works hard and picks 60 carrots every day. Foxy Tail is sloppy but also stronger, so he picks 90 carrots a day.*

a). How long would it take LJ to harvest all carrots on his own?

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b). How long would it take FT to harvest all carrots on his own?

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c). How many carrots can LJ and FT harvest together in one day?

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d). How long would it take LJ and FT to harvest all carrots if they work together?

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e). How many carrots would FT harvest if they work together?

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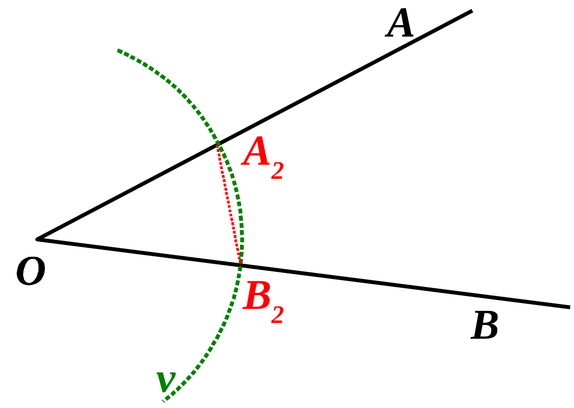
2 Solve equations:

$144 : x - 12 = 6$

$144 : (x - 12) = 6$

Plotting an equal angle:

3 Plot $\angle \boldsymbol{QRP}$ that is equal to the given $\angle \boldsymbol{AOB}$:



Plotting $\angle \boldsymbol{QRP}$ that is equal to the given $\angle \boldsymbol{AOB}$

// Plotting auxiliary equal circles

1. Plot $\boldsymbol{v}$ = Circ($\boldsymbol{O}$, $\boldsymbol{x}$)

2. Plot $\boldsymbol{w}$ = Circ($\boldsymbol{R}$, $\boldsymbol{x}$)

// Finding connecting arc

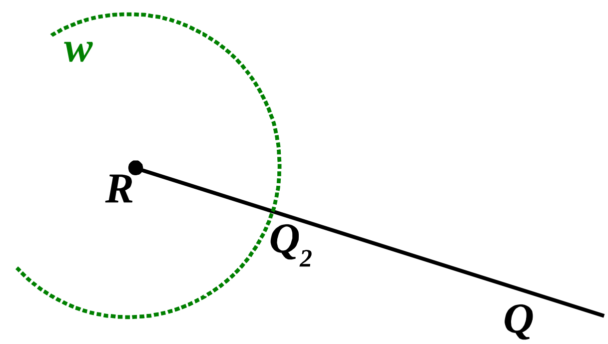
3. Find $\boldsymbol{A_2} = \boldsymbol{v} \cap [\boldsymbol{OA})$

4. Find $\boldsymbol{B_2} = \boldsymbol{v} \cap [\boldsymbol{OB})$

// Plotting an equal arc

5. Plot $\boldsymbol{q}$ = Circ($\boldsymbol{Q_1}$, $|\boldsymbol{A_2B_2}|$)

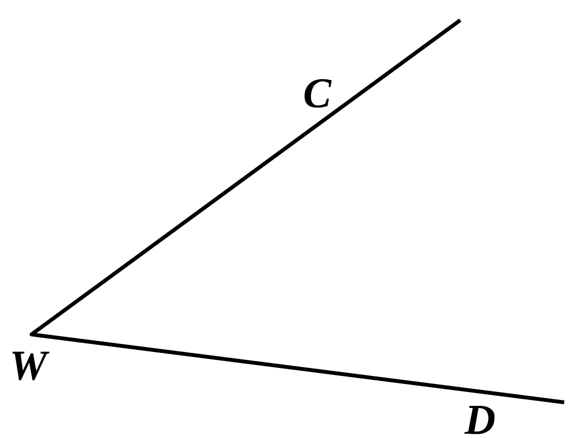
6. Find $\boldsymbol{P} \in \boldsymbol{w} \cap \boldsymbol{q}$

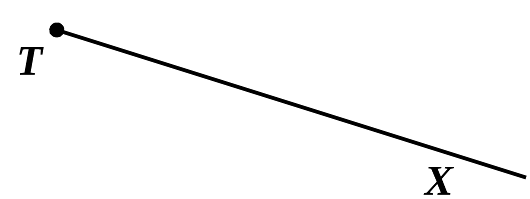


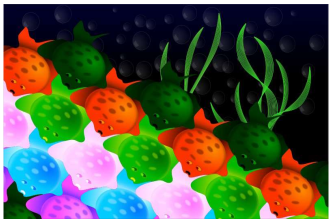
Equal angles cut equal arcs from equal circles with centers at the vertexes of these angles

Equal arcs are connected by equals chords

4 Plot $\angle \boldsymbol{XTZ} = \angle \boldsymbol{CWD}$



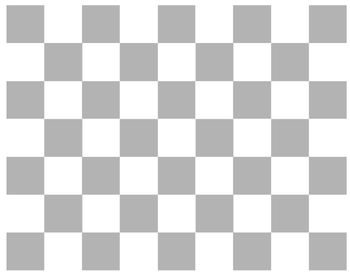


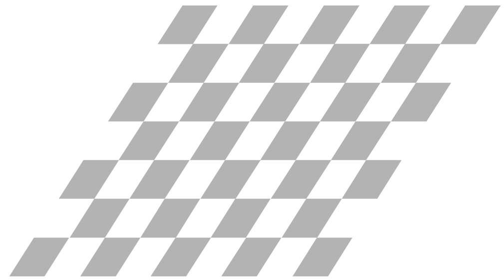


Tessellations:

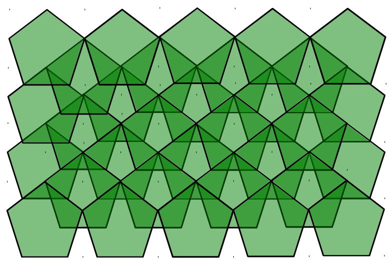
A coverage of a plane by identical shapes without overlaps is called a tessellation.

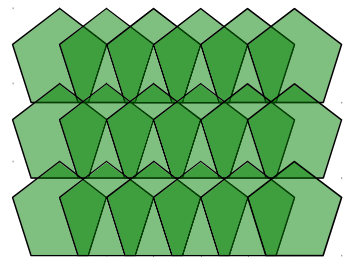
For example, a plane may be paved by squares or any parallelograms.





These tessellations look like they are made of pentagons; but these pentagons overlap. Which elements are actually used to makes these tessellations?

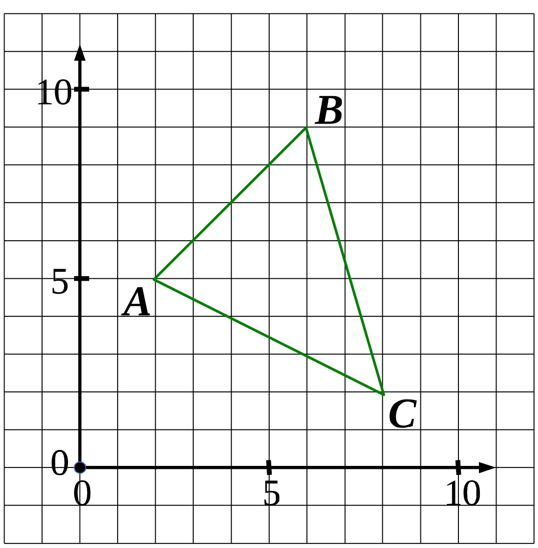


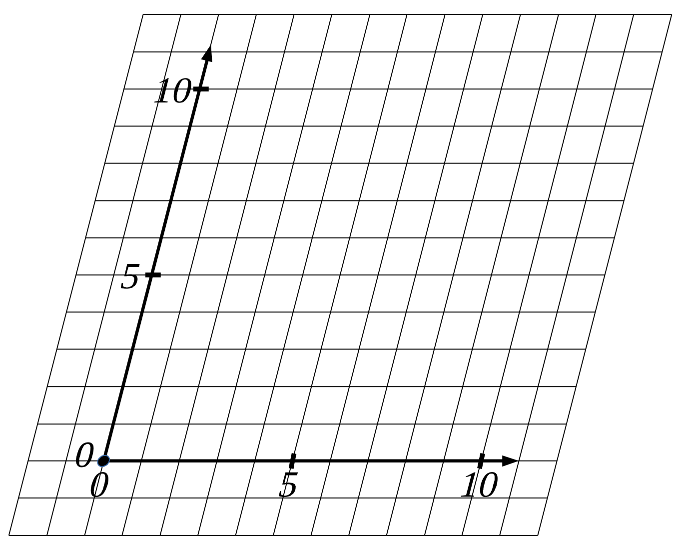


Coordinates are tessellations.

The ½ cm squares in you notebook are tessellations

Redraw △***ABC*** in the "tilted" coordinates made of parallelograms:

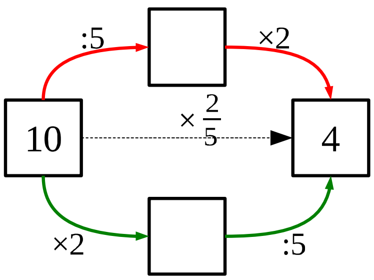


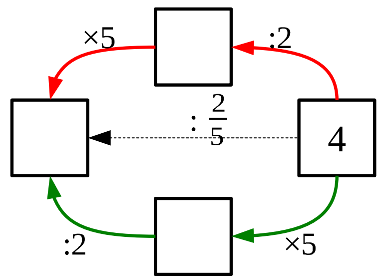


Dividing by a random fraction $\boldsymbol{\frac{m}{n}}$ **.**

By definition dividing ***S*** my ***a*** means finding such ***b*** that:

$$\boxed{S : a \stackrel{def}{=} b \quad \Leftrightarrow \quad b \times a = S}$$

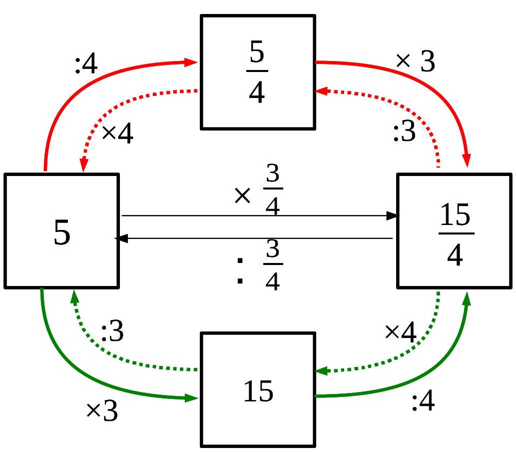


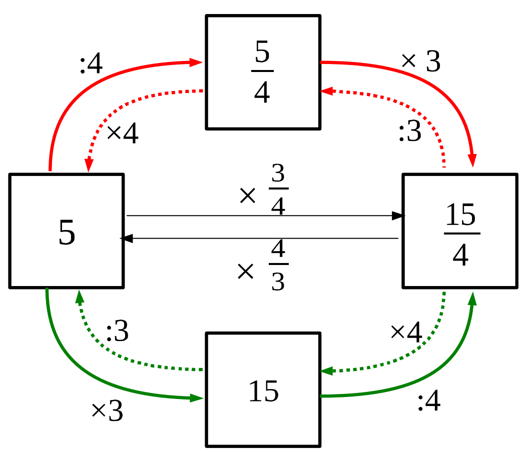


$10 \times \frac{2}{5} = 10 : \square \times \square = 4$ $\qquad$ $10 \times \frac{2}{5} = 10 \times \square : \square = 4$

$$\boxed{\text{Therefore: } \quad 4 : \frac{2}{5} \stackrel{def}{=} 10}$$

In order to find the quotient we need to undo the operations performed upon multiplication by a fraction!





Dividing a number by a fraction $\frac{m}{n}$ is equivalent to multiplying this number by the inverse fraction $\frac{n}{m}$.

5 Calculate:

$3 : \frac{2}{3} = 3 \times \frac{\square}{\square} =$ $\qquad$ $4 : \frac{2}{5} = 4 \times \frac{\square}{\square} =$ $\qquad$ $5 : \frac{3}{4} = 5 \times \frac{\square}{\square} =$

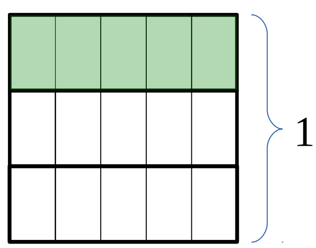
$3 : \frac{1}{3} = 3 \times \frac{\square}{\square} =$ $\qquad$ $7 : \frac{3}{5} = 7 \times \frac{\square}{\square} =$ $\qquad$ $4 : \frac{3}{4} = 5 \times \frac{\square}{\square} =$

Equivalent fractions.

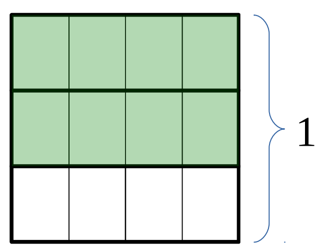
Any fraction $\frac{m}{n}$ may be expressed with a multiple denominator and a corresponding factor: $\frac{m}{n} = \frac{2 \times m}{2 \times n} = \frac{3 \times m}{3 \times n} = \frac{k \times m}{k \times n}$

Similarly, certain fractions may be simplified $\frac{k \times m}{k \times n} = \frac{m}{n}$

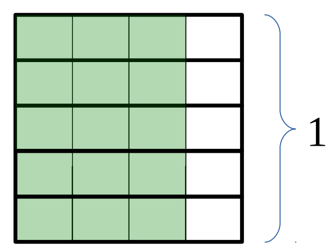
$\frac{1}{3} = \frac{5}{15}$



$\frac{2}{3} = \frac{8}{12}$



$\frac{3}{4} = \frac{15}{20}$



6 Transform the fractions into equivalent ones by changing their denominators and factors appropriately. Some examples are impossible to do. Cross them out.

$\frac{3}{4} = \frac{\square}{12}$ $\qquad$ $\frac{2}{7} = \frac{\square}{21}$ $\qquad$ $\frac{3}{9} = \frac{\square}{3}$

$\frac{\square}{6} = \frac{4}{12}$ $\qquad$ $\frac{\square}{9} = \frac{7}{26}$ $\qquad$ $\frac{12}{8} = \frac{3}{\square}$