

CLASSWORK 15, January 26, 2020

1. **Rational number** is a real number that can be written as a simple/irregular fraction, i.e as a proportion $\frac{a}{b}$.
2. A rational number is a reoccurring decimal. Can be proved using remainder and Pigeonhole principle.

Decimal fractions:

$$\frac{2}{7}$$

Handwritten long division of $2 \div 7$ on grid paper. The quotient is $0.2857142...$. The remainders are listed to the right of the division steps: $R = 2, 6, 4, 5, 1, 3, 2$. A curved arrow connects the final remainder 2 back to the first remainder 2, indicating the repeating cycle.

Find simple fractions for $0.\bar{3}$, $0.\bar{71}$,

$0.\bar{3} = x$, multiply by 10.

$$3.\bar{3} = 10x \rightarrow 3 + 0.\bar{3} = 10x \rightarrow 3 + x = 10x$$

Equations:

$$7x = 2 \quad \frac{3}{8}x = \frac{1}{3} \quad \frac{3x+2a}{2a-5x} = -1$$

Operations with powers: $a^n = a \cdot a \cdot \dots \cdot a$ (n times)

$$(a \cdot b)^n = a^n \cdot b^n$$

$$a^m \cdot a^n = a^{m+n};$$

$$a^m \div a^n = a^{m-n}$$

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

HOMEWORK 15,
January 26, 2020

1. Simplify the following and show the answer in the exponent form

a) $\frac{3^7 \cdot 2^7}{2^3 \cdot 2^4} =$

b) $\frac{6^5 \cdot 2^4}{3^5 \cdot 2^2} =$

c) $\frac{7^9 \cdot 2^5}{7^2 \cdot 2^4} =$

d) $\frac{11^4}{11^2 \cdot 5^2 \cdot 5^3} =$

e) $7^4 \cdot 11^2 \cdot 11^{-5} \cdot 7^2 =$

f) $\frac{3^{-5} \cdot 2^7}{3^{-3} \cdot 2^4} =$

g) $\frac{42^2}{6^2} =$

h) $\frac{3^5 \cdot 3^{-5}}{3^9} =$

i) $\frac{x^2 \cdot y^2 \cdot x^{-3}}{x^2} =$

2. Find a simple fraction form for the following repeating decimals:

a) $0.\bar{6}$

b) $0.\bar{7}$

c) $0.\bar{8}$

3. Using pencil, ruler, and **quadrille** paper construct a rectangle ABCD with sides 3cm and 4 cm. Measure the diagonal AC.
4. Using pencil, ruler, and quadrille paper construct isosceles triangle ABC with the base 5 cm and the height 4 cm. Using protractor measure all angles in your triangle: $\angle A$, $\angle B$, $\angle C$.
5. Using compass construct a circle with radius 45 mm. Construct another circle with radius 30 mm and the center on any point on the first circle. Draw a line QF between two fathers points on the circles. Measure this distance in mm. $|QF| =$
6. Using compass construct a circle with radius 5 cm. Using ruler draw diameter AB. Put any point K on the circle and construct the triangle ABK. Using protractor measure $\angle K$.