Accelerated math. Homework 21.



Problems marked with ** are very difficult.

- Draw a triangle. Measure the sides of the triangle, mark the midpoint of each side and draw medians. (remember, median is a segment, drawn from the vertex of a triangle to the midpoint of the opposite side)
- 2. Draw a triangle, measure each angle, draw three bisectors.
- 3. Draw a triangle. Take a sheet of paper, fold it twice. Do it accurately. You now have a right angle template. Draw three altitudes in your triangle. Use ruler, pencil.
- 4. A traveler to the island of Knights and Knaves meets a group of five people (call them A, B, C, D, E). A says: "exactly one of us is a Knight"

B says: "exactly two of us are Knights"

C says: "exactly three of us are Knights"

D says: "exactly four of us are Knights"

E says: "all five of us are Knights"

Can you find out which of them are Knights? (Remember, Knights always tell the truth, and Knaves always lie).

- 5. Water lilies are growing in a lake. The area covered with lilies is doubling every week. The lake was completely covered with lilies in 8 weeks. In how many weeks only half of the lake was covered?
- 6. Calculate (first represent the periodic decimals as fractions);
 - a. $0.\overline{71} + \frac{1}{2}$; c. $0.\overline{8} 0.\overline{80}$;
 - b. $0.\overline{6} \cdot 0.\overline{4};$

Example, how represent the periodical decimals as fractions:

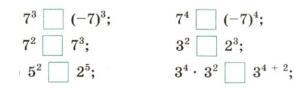
 $\begin{array}{l} x = 0,0(7), \\ x = 0,0777..., \\ 10x = 0,777..., \\ 100x = 7,777..., \\ 100x - 10x = 7, \\ 90x = 7, \\ x = \frac{7}{90}; \end{array}$

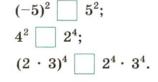
x = 0, 5(7),x = 0.5777...,10x = 5,777...,100x = 57,777...100x - 10x = 52, 90x = 52,

d. $0.7272 \dots + \frac{3}{11}$;

 $x = \frac{52}{90}$

7. Compare:





8. Without doing direct calculation, prove that

- a. $A = 121 \cdot 19 + 212 \cdot 19$ is divisible by 57
- b. $B = 765 \cdot 25 421 \cdot 25$ is divisible by 100

9. Which fractions among the following can be represented as finite decimals? Represent them as fraction with denominator 100 and decimals.

$$\frac{7}{25}$$
, $\frac{9}{60}$, $\frac{5}{12}$, $\frac{6}{15}$, $\frac{3}{20}$, $\frac{7}{70}$, $\frac{3}{18}$, $\frac{5}{4}$

10. Compare with 0 following expressions:

Example:

$$(-7)^2 \cdot (-3)^7$$

 $(-7)^2 > 0, (-3)^7 < 0,$
 $(-7)^2 \cdot (-3)^7 < 0$
 $(-11)^{30} \cdot (-9)^{20};$
 $(-5)^{20} \cdot (-4)^9;$
 $(-5)^{20} \cdot (-4)^9;$
 $(-12)^{5};$
 $(-21)^{10};$
 $(-21)^{10};$
 $(-21)^{10};$

11. Draw a segments 3 cm long, 5.4 cm long, 7.8 cm long. Draw angles 35°, 57°, 200°.