

HOMEWORK 9,
December 3, 2017

1. Solve equations:

(a) $\frac{9}{13}z = 3$

(b) $|x| = 2$

(c) $|x + 11| = 2$

(d) $\frac{x}{2} + 1 = \frac{4x}{7}$

(e) $x = \frac{1}{4}x + 6$

(f) $\frac{x+3}{x+1} = 4$

2. Factorize:

(a) $2 \cdot 3 + 2 \cdot 5 =$

(b) $5a + 5b - 5c =$

(c) $ma - ab =$

3. David and Michael together have 93 cents; Michael and Gennady together have 104 cents; Gennady and David together have 95 cents. How much money does each of them have?

4. Two cities, A and B, are on the same river. It takes the motorboat 2.5 hours to travel from A to B, and 5 hours to travel from B to A (because B is downstream from A, so going back it has to go against the flow). How fast is the river flow if the speed of the boat (in still water, say on a lake) is 12 km/h? How far away are the cities? [Hint: if the flow is x km/h, then going down stream the boat makes $12 + x$ km/h....]

5. A swimming pool can be filled by an inlet pipe in 12 hours and emptied by an outlet pipe in 15 hours. One day the pool is empty and the owner opens the inlet pipe to fill it. However, he forgets to close the outlet pipe. How long will it take the pool to fill?

6. Here are phrases in Swahili with their English translations:

- atakupenda – He will love you.
- nitawapiga – I will beat them.
- atatupenda – He will love us.
- anakupiga – He beats you.
- nitampenda – I will love him.
- unawasumbua – You annoy them.

Translate the following into Swahili:

- You will love them.
- I annoy him.

7. Add two base 4 numbers: [Do not add in base 10 and translate the result to base 4, try performing addition in base 4, **think base 4**]

$$\begin{array}{r} 123 \\ + 321 \\ \hline \end{array} \qquad \begin{array}{r} 3201 \\ + 2310 \\ \hline \end{array}$$