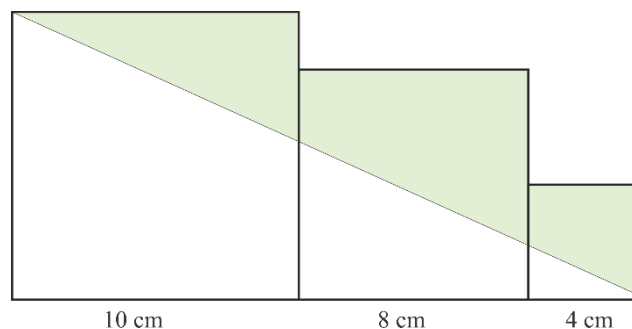Math 5b. Classwok25.

Numeral systems.

1. Write 75_{10} in base 3 system.

2. Write 1201_3 in decimal system.

3. Write 1201_3 in binary system.

4. Alex thought of three different non-zero digits. Ben wrote down all possible two-digit numbers whose decimal representation used only these digits. The sum of the written numbers is 231. Find the digits Alex thought of.

5. Three pirates were dividing a bag of coins. The first one took 3/7 of all the coins, the second took 51% of the remainder, after which the third one was left with 8 coins less than the second one received. How many coins were in the bag?

6. There are 4 people in the family. If Masha's scholarship is doubled, the total income of the whole family will increase by 5%; if instead the mother's salary is doubled – by 15%; if the father's salary is doubled – by 25%. By what percentage will the total income of the whole family increase if the grandfather's pension is doubled?

7. For breakfast, Ben ate 40% of the cake, and his little brother John ate 150 g. For lunch, their mother ate 30% of the remainder and another 120 g, and cat Matilda licked up the remaining 90 g of crumbs from the cake. What was the original mass of the cake?

8. Three squares are formed the shape below. What is the area of the shaded part?

10 cm   8 cm   4 cm

9. Rewrite without parenthesis;

   a. $(2 + 2a)(2 + 3a)$;   b. $(1 + x)^2$;

10. Evaluate for $a = 1.5, b = 0.7, c = -0.5$

   a. $\dfrac{a - b}{a + b} + \dfrac{b - c}{b + c} + \dfrac{c - a}{c + a}$;   b. $\dfrac{(b - a)(b - c)(c - a)}{(a + b)(b + c)(c + a)}$

11. Solve the equations:

   1) $|x| = x$;   3) $|x| = 2x$;   5) $|x - 1| = 0$;   7) $|x + 1| = 4$;

   2) $|x| = -x$;   4) $|2x| = 6$;   6) $|2x - 1| = 0$;   8) $|x - 2| = -3$.

12. Which statement is true?

   a. $a + b > 0$ or $a + b < 0$;   b. $a - b > 0$ or $a - b < 0$

   c. $ab > 0$ or $ab < 0$;   d. $\dfrac{b}{a} > 1$ or $\dfrac{b}{a} < 1$