Zdravka Paskaleva, Maya Alashka

BULGARIAN MATH 2
WORKBOOK
OR 7 B

adapted for U.S. High Schools
and Excellent Middle Schools

Translated, Adapted, and Augmented
by
Zvezdelina Stankova
Founder and Director
of the Berkeley Math Circle

АрхИ(Ѵ)ЄΔ
PUBLISHING HOUSE

BULGARIAN MATH 1 (7A) WORKBOOK
for U.S. High Schools and Excellent Middle Schools

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PART I: 7B WORKSHEETS W81-159

The 7B Workbook will strengthen the basic knowledge and skills needed to master the 7B material. To each topic in the 7B Textbook correspond problems in the 7B Workbook that every student should be able to solve. Some problems have a solution and some have the beginning of a solution. After working on such problems, students should be able to complete on their own the remaining problems.

The 7B Worksheets highlight the basic knowledge in 7B Textbook; have a teaching component; help students learn to organize and correctly write solutions to problems; and save time for the teacher in searching for more problems. The 7B Worksheets can be used for independent work by the student; to assign homework; to conduct tests; and for practical work with applications.

CONTENTS

PART II: 7B LESSON EXERCISES | L81-160

These worksheets come directly from the 7B textbook. They consists of the examples from each lesson that have space for students' solutions. The worksheets can be used for directed individual or group work in class.

The worksheets are to be used in tandem with the textbook. In addition to completing these worksheets, the full solutions, discussions, and remarks in the textbook should be carefully read and understood by the student.

CONTENTS

L80 Ray, Half-Plane, and Angle

Example 1 Find $\alpha + \beta$ and $\alpha - \beta$ if:
a) $\alpha = 28°43'$, $\beta = 20°58'$;
b) $\alpha = 90°$, $\beta = 35°15'$.

Solution:

Example 2 The angle bisector of $\alpha = 121°13'$ divides it into two angles. Find their measures.

Solution:

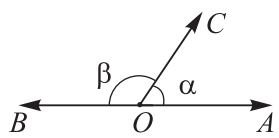
L81 Supplementary Angles. Right Angles

Example 1 Angles α and β are supplementary. Find angle β if:
a) $\alpha = 30°$; b) $\alpha = 47°30'$; c) $\alpha = 32°18'10''$.

Solution:

Example 2 What is the degree measure of an angle that is four times as large as its supplement?

Solution:



Example 2 Noting the theorems used, solve the equation $7x-2=x-5$ and perform a check.

Solution:

Check:

Example 3 Solve the equation $5x-3-3x-1=4x-2\cdot 7$.

Solution:

Example 4 Prove that the equations are equivalent:
(1) $3x-2=5x+4$ and (2) $7x-1=2x-16$.

Proof:

The Equation $ax+b=0$ L96

Example 1 Solve the equations:
a) $2x+10=0$; b) $9x+3=2x+5$; c) $4.3x+2=2x+1\div 0.5$.

Solution:

L96 The Equation $ax + b = 0$. Part I

Example 2 Solve the equation $6x^2 - (2x-1)(3x+1) = 3(1-x)$.

Solution:

Example 3 Solve the equation $(2x+1)^2 - 3 = 4(x^2+1) + x$.

Solution:

Example 4 Find a number with the property: "The difference of the square of a number and double the number is equal to the square of the difference of this number with the number 1."

Solution:

L97 The Equation $ax + b = 0$. Part II

Example 1 Solve the equations:

a) $7 - (x-3)(x+3) = 2x - (x+2)^2$; b) $-7x - [2 - 3(x-1)] + 2x = 5$.

Solution:

Example 1 Given is an isosceles ΔABC ($AC = BC$). Prove that:

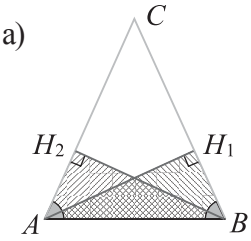
a) If AH_1 and BH_2 are altitudes, then $\Delta ABH_1 \cong \Delta BAH_2$ and $AH_1 = BH_2$.

b) If AM_1 and BM_2 are medians, then $\Delta ABM_1 \cong \Delta BAM_2$ and $AM_1 = BM_2$.

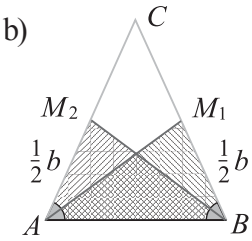
c) If AL_1 and BL_2 are angle bisectors, then $\Delta ABL_1 \cong \Delta BAL_2$ and $AL_1 = BL_2$.

Proof:

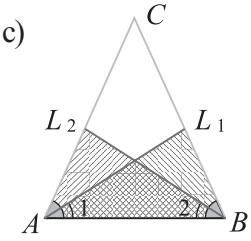
a)



b)



c)



Example 3 Prove that if in ΔABC:

a) $h_c = m_c$, then ΔABC is isosceles with top vertex C.

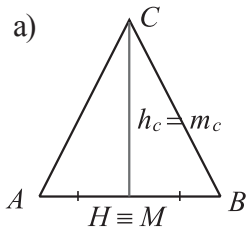
b) $h_c = l_c$, then ΔABC is isosceles with top vertex C.

c) $m_c = l_c$, then ΔABC is isosceles with top vertex C.

d) s_{AC} and s_{BC} are perp. bisectors and $MN = M_1N_1$ as in the figure, then ΔABC is isosceles with top vertex C.

Proof:

a)



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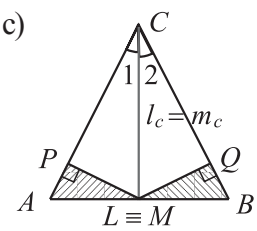

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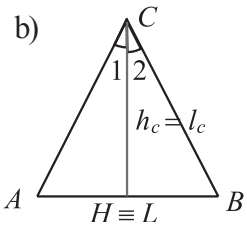
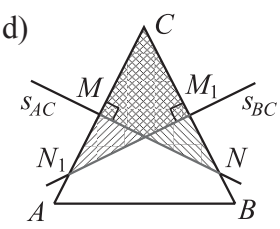


d)



W81 Supplementary Angles

1 Angles α and β are supplementary. Find angle α if:
a) $\beta = 43°$; b) $\beta = 101°20'$; c) $\beta = 20°20'20''$.

Solution:

a) $\alpha + \beta = 180°$	b)	c)
$\alpha + 43° = 180°$		
$\alpha =$		
$\alpha =$		

2 Angles α and β are supplementary. Find angle β if $\alpha = \beta + 40°$.

Solution:

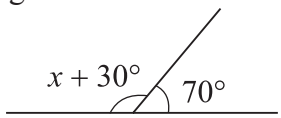
$\alpha + \beta = 180°$

3 Angles α and β are supplementary. How many degrees is each of them if:
a) $\alpha : \beta = 2 : 1$; b) $\alpha : \beta = 4 : 5$.

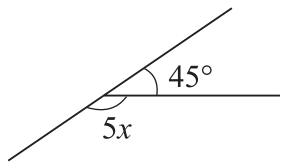
$\alpha = 2x$, $\beta =$

4 Using the notation in the drawing, find x.

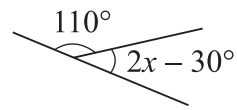
a)



b)



c)



The Equation $ax + b = 0$, Part I

1 Solve the equations:

a) $(x + 2)^2 - x(x + 5) = 2(x - 3)$;

b) $(2x - 1)^2 - (x - 3)^2 = 3x(x + 2)$.

2 Show that the equation $(2x + 3)(2x - 3) - (2x - 1)(2x + 1) = 5$ has no solution.

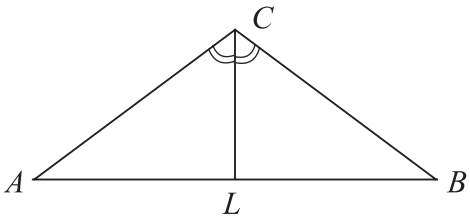
3 Show that the equation $(3x - 2)^2 - 8x(x - 2) = (-x - 2)^2$ has any number as a root.

4 Solve the equations:

a) $\frac{x}{3} + 2 = \frac{x}{6} + 1$;

b) $\frac{x-2}{6} = \frac{2x-5}{12}$.

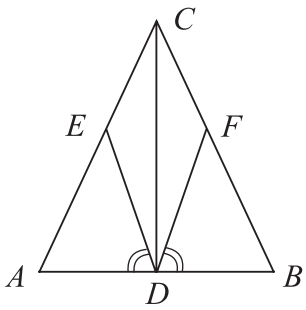
1 Given:
ΔABC ($CA = CB$)
$\angle ACB = 120°$
$CL = 8$ cm
CL angle bisector



Find:
AC.

Solution:

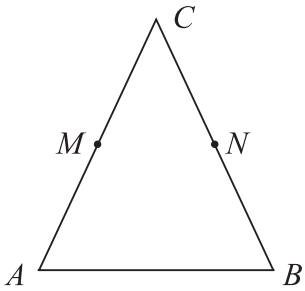
2 Given:
ΔABC ($CA = CB$)
CD altitude
$\angle ADE = \angle BDF$



Prove:
$CD \perp EF$.

Proof:

3 Given:
ΔABC ($CA = CB$)
M and N midpoints of CA and CB



Prove:
$MN \parallel AB$.

Proof: