# Instructions – Part I

**Time**
90 minutes for Part I. It is recommended that you use a maximum of 45 minutes for working with the part where calculator is not allowed. You may not use your calculator until you have submitted your answers to this part.

**Aids**
**Part where calculator is not allowed:** Approved formula page and ruler.
**Question 15:** Calculator, approved formula page and ruler.

**The part without calculator**
This part consists of questions to be solved without a calculator. Two of the questions require that you explain your solution. Present your solutions in the figure and the box nearby the question. The rest of the questions require only the answer. After each question the maximum number of points available for your answer/solution is shown.

**Question 15**
This question is a larger question, which normally requires more time. In the box below the question you can see what considerations the teacher will make in assessing your solution.

**Grading**
The test (Part I + Part II) gives a total maximum of 60 points, of which 27 are vg-points.

*Lower limits for examination grade*
Pass: 19 points.
Pass with distinction: 35 points of which at least 9 vg-points.
Pass with special distinction: At least 18 vg-points. In addition you must demonstrate several of the MVG-qualities that are possible to show in the questions marked ¤.

Name: _____

Date of birth: _____

Adult education/Secondary school program:_____

**Name:**................................................................ **Class/Group:**........................................

## Part I

**1.** The figure to the right is in natural scale 1:1. What is the approximate area of the figure? Circle your answer.

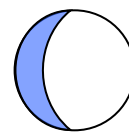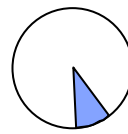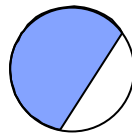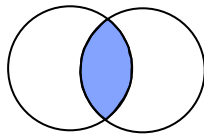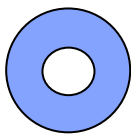3 cm²        3 dm²        6 cm²        6 dm²        9 cm²        9 dm²                                          (1/0)

**2.** What number must be written in the box for the equality to be true?

8.07 +  [   ]  + 2.33 = 12.45                    Answer:_____        (1/0)

**3.** How many minutes are there in 0.25 hours?        Answer:_____ min        (1/0)

**4.** Which of the shaded regions below is a circle sector? Circle your answer.                                          (1/0)

**5.** Which of the following numbers is the best approximation for $\dfrac{148}{0.53}$? Circle your answer.

50            80            100            300            750                                          (1/0)

**6.** Write the correct prefix (*m*, *c*, *d*, *h* or *k*)
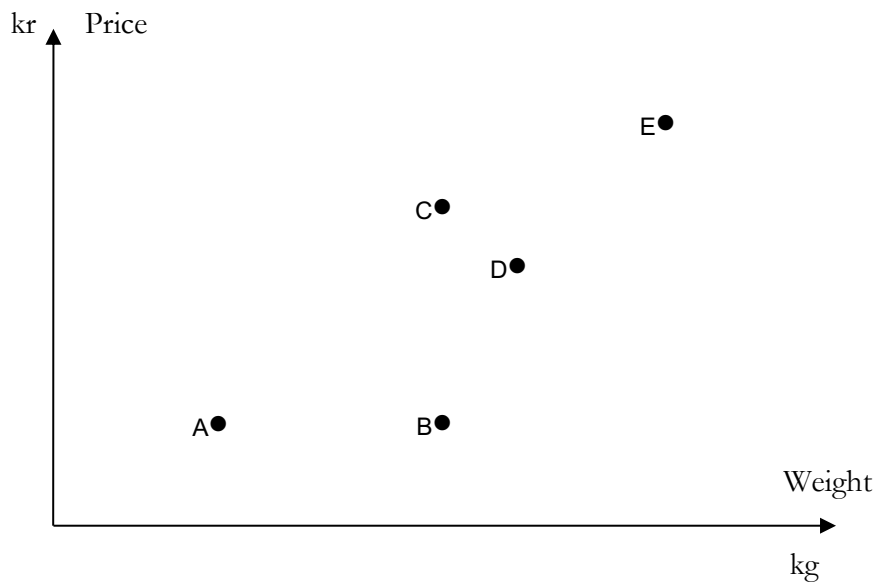at the arrowhead in front of the unit m

so that equality holds.                    Answer: $5.4 \cdot 10^{-2} \, m = 5.4$ _____m          (1/0)

**7.** Solve the equation $106 = 8x + 102$          Answer: _____$x =$ _____          (1/0)

**8**. A shop made a study of weights and prices
for chocolate bars. The result is shown
in the following diagram.
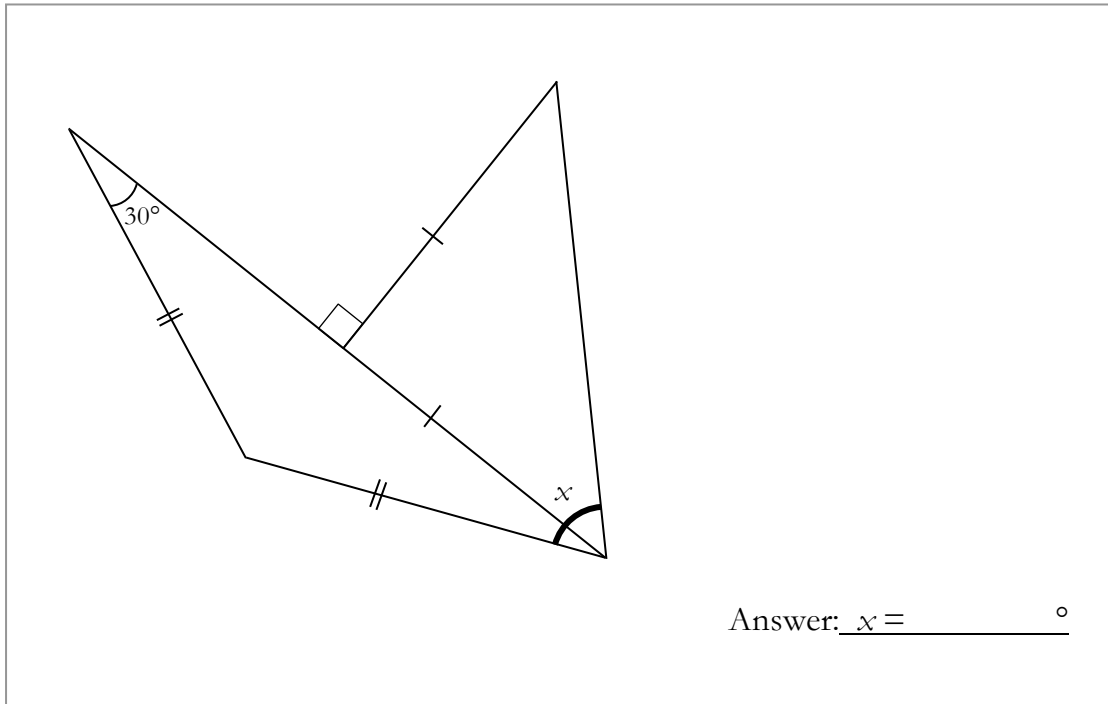


a) Which of the chocolate bars have
   the same weight?                    Answer: _____          (1/0)

b) Which chocolate bar has the highest price
   per kilogram? Explain your solution using
   the diagram and in the space below.          (0/1)¤

**9.** The figure consists of two isosceles triangles.
Angle *x* in the figure consists of two smaller angles.
Calculate angle *x*. Write your solution in
the space provided.                                                    (1/1)



Answer: *x* = _____ °

**10.** On a map drawn in the scale 1:50 000 it is 6 cm
between two places. What is this distance
in reality? Answer using a *suitable* unit.        Answer:_____        (0/1)

**11.** Find the value of $a - b$ if $a = -5$ and $b = -20$        Answer:_____        (0/1)

**12.** The table shows the relation between *x* and *y*

| *x* | 1 | 2 | 4 | 6 | 8 |
|-----|---|---|----|----|----|
| *y* | 5 | 7 | 11 | 15 | 19 |

Circle the formula that describes the relation
between *x* and *y*
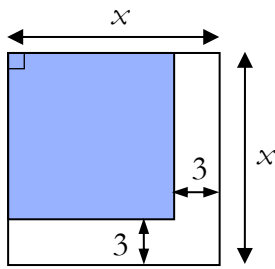
$y = 5x$        $y = 6 - x$        $y = 6x - 1$        $y = x^2 + 4$        $y = 2x + 3$        (0/1)
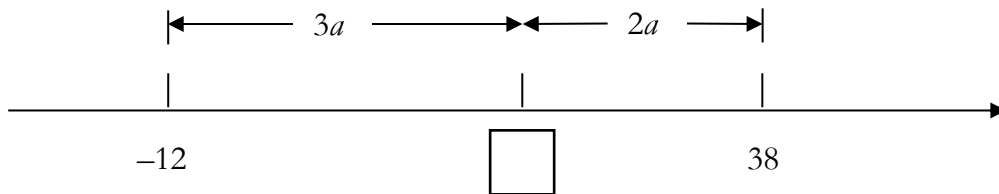
Continue on next page!

**13.** Write an expression for the shaded area.     Answer:_____     (0/1)



**14.** What number should be written in the box?



Answer: _____     (0/1)

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# Question 15 – Think of a number

**Game with numbers**

- Think of a two-digit positive integer.
- Calculate the sum of the digits.
- Subtract the number you first thought of.

**Example**

I am thinking of the number 68

The sum of the digits is $6+8=14$

$68 - 14 = 54$          Answer $= 54$

➡ Think of a new two-digit integer and do the same steps as above for this number.

➡ Repeat this investigation with new numbers until you discover what the resulting answers have in common. What do the resulting (answers) have in common?

➡ Show that your conclusion is true for all two-digit positive integers.
Hint: The value of the two-digit number *ab* can be written as $10 \cdot a + b$

➡ Investigate whether your conclusion is also true for three-digit positive integers.

(4/5) ¤

**In assessing your work the teacher will take into consideration**
- what mathematical knowledge you have shown and how well you have carried out the task
- how well you have explained your reasoning and defended your conclusions
- how well you have presented your written solution.