

Vasa övningsskola  
IB Section

## Entrance test Mathematics Example I

Answer all questions on this question paper. Show your working.

Calculators are not allowed.

Each question is worth six marks.

Name: \_\_\_\_\_

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1. Calculate. Simplify the answer if it is possible.

a)  $5 + 2 \cdot 7$

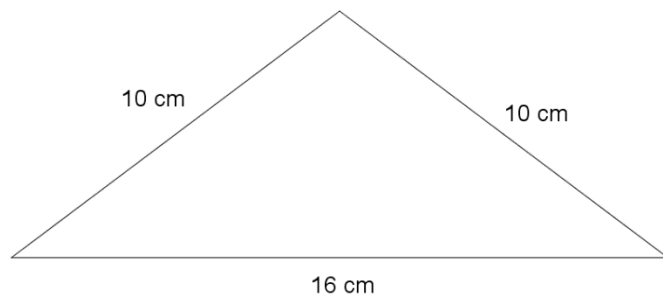
b)  $\left(-\frac{1}{3}\right)^2$

c)  $\frac{2}{3} - \frac{3}{4}$

d)  $\left(1\frac{2}{6}\right) \cdot \frac{3}{10}$

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2. Calculate the area of the triangle.



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3. Simplify

a)  $(2x - y)^2$

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

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4. Solve the equations

a)  $6 - 2x = 3x + 21$

b)  $\frac{2x-1}{3} = \frac{2x+3}{5}$

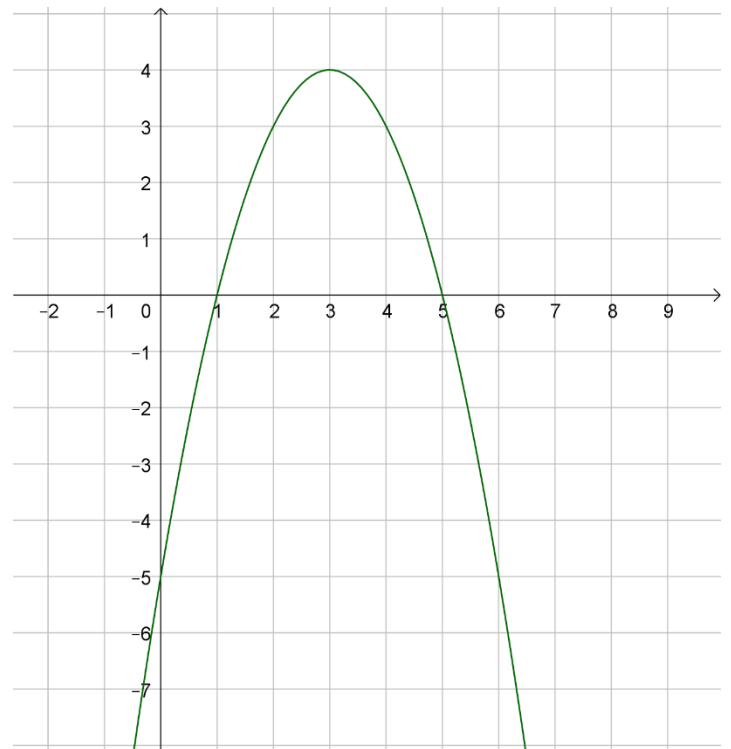
c)  $x^2 = 49$

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5. a) There are 14 girls and 6 boys in a class. How many percent of the pupils are girls?  
b) A price was decreased from 150 € to 120 €. How many percent was the price decreased?  
c) A bag contains blue and red balls. There are 6 red balls and this is 40 % of all balls in the bag. How many blue balls are there in the bag?

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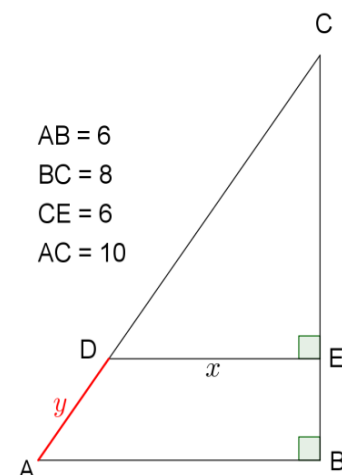
6. The graph of the function  $f(x)$  is drawn.

- a) Find the  $x$ -intercepts of  $f$ .  
b) Find  $f(0)$  and  $f(3)$ .  
c) Find  $x$  such that  $f(x) = 3$ .



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7. Calculate the length of DE (named  $x$  in the picture) and the length of AD (named  $y$ )



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8. The first five numbers in a sequence are 110, 107, 104, 101 and 98.

- a) Find the 10th number in the sequence.
- b) Which number (what position) is 62?
- c) How many of the numbers in the sequence are positive?

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9. a) Two persons can paint a house in 20 hours. How many persons are needed to paint the house in 8 hours? We assume that all persons paint equally fast.

b) A car can drive 100 km with 8 litres of fuel. How far can it drive with 22 litres of fuel?

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10. The following rule is valid:  $\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$ . For example:  $\sqrt{2} \cdot \sqrt{3} = \sqrt{2 \cdot 3} = \sqrt{6}$   
Simplify as much as possible

a)  $\sqrt{3} \cdot \sqrt{12}$       b)  $\sqrt{\frac{2}{3}} \cdot \sqrt{24}$       c)  $\sqrt{1\frac{1}{4}} \cdot \sqrt{7\frac{1}{5}}$