

Vasa övningsskola
IB Section

Entrance test mathematics, Example II

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

Calculators are not allowed.

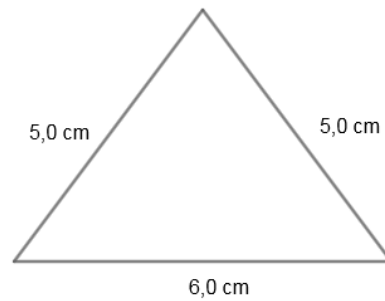
Each question is worth six marks.

Name: _____

1. Calculate

a) $3 - 6 \cdot 2$ b) $\left(\frac{4}{5}\right)^2$ c) $(-2)^2 - (-2)$ d) $\frac{5}{9} \cdot \frac{27}{50}$

2. Calculate the area of the triangle.

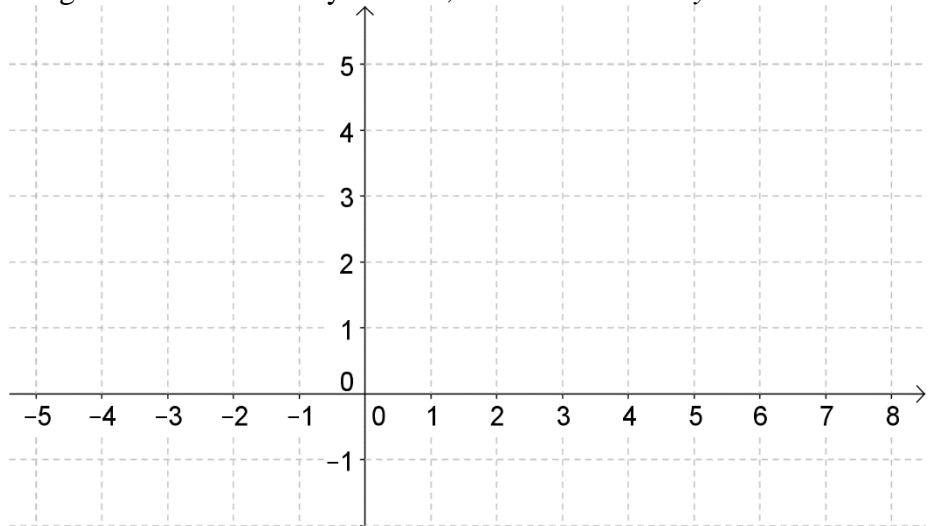


3. Simplify a) $a^2 - a(3a - 4)$ b) $(2x + 3y)(3y - 2x)$

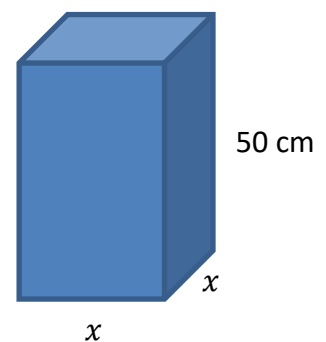
4. Solve the equations a) $9 - 3(4x - 5) = -6x$ b) $\frac{x+1}{3} = \frac{2x+4}{5}$

-
5. a) Find the 100th number in the sequence 2, 5, 8, 11, ...
b) In Fibonacci's sequence you always get the next number by adding the two previous numbers. If it starts with numbers 3 and 4 the first numbers are 3, 4, 7, 11, ... Find the 6th and the 7th number in the sequence.
-

6. A straight line passes through the points $(-2, 1)$ and $(4, 4)$.
a) Sketch the line in the coordinate system
b) Find the area of the triangle that is bounded by the line, the x -axis and the y -axis.



-
7. The cuboid has a base shaped as a square and the height 50 cm. The volume of the cuboid is 80 litres.
a) Find the side edge (x) of the base.
b) Calculate the total surface area of the cuboid.



Not drawn to proportion!

8. a) There are 13 girls and 7 boys in a class. How many percent of the pupils are girls?
- b) In another class there are 12 boys. The girls are 60 % of the pupils in the class. How many pupils are there in the class altogether?
- c) There are three red balls and one black ball in a box. Two of them are taken out randomly. What is the probability that they are both red?
-

9. The following rule is valid: $\sqrt{a \cdot b} = \sqrt{a}\sqrt{b}$.
For example: $\sqrt{50} = \sqrt{25 \cdot 2} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$
- a) Rewrite $\sqrt{12}$ and $\sqrt{27}$ according to the example above.
- b) Simplify $\frac{\sqrt{27}}{\sqrt{12}}$ using your answers in the a-case
-

10. Alice and Bob pick strawberries. Alice picks 1 litre in 10 minutes and Bob picks 1 litre in 6 minutes. How long (in minutes) does it take them together to pick a total of 12 litres?