

MATHEMATICS
Vasa övningsskola
IB Entrance Examination
2011

Name : _____

This is a two-part test where

- Part 1 (6 questions) is a multiple-choice test
- Part 2 (8 questions) is problems to be solved

Answer as many questions as possible.

You are NOT allowed to use a calculator.

Time 50 minutes

Section 1 – Multiple Choice Test

Each task has exactly one correct alternative.

Circle the correct answers.

Each task can give a maximum of one mark.

- In an isosceles triangle the greatest angle is 120° . The smallest angle is
a) 20° b) 30° c) 40° d) 50° e) 60°
- The expression $\frac{1}{2} + \frac{2}{3}$ can be simplified to
a) $\frac{1}{3}$ b) $\frac{3}{5}$ c) $\frac{7}{12}$ d) $1\frac{1}{3}$ e) $1\frac{1}{6}$
- The root of the equation $\frac{6-2x}{x} = x^2 - 3x$ is
a) $x = 1$ b) $x = 2$ c) $x = 3$ d) $x = -2$ e) $x = -1$
- If two dice are thrown the most probable sum is
a) 6 b) 7 c) 8 d) 9 e) 10
- The root of the equation $4 = \frac{6}{x}$ is
a) $x = 24$ b) $x = \frac{2}{3}$ c) $x = \frac{3}{2}$ d) $x = \frac{4}{3}$ e) $x = \frac{3}{4}$
- The value of the expression $5^5 + 5^5 + 5^5 + 5^5 + 5^5$ is
a) 25^{25} b) 25^5 c) 5^{25} d) 5^6 e) 5^{10}

Section 2

Solve all tasks directly on the question paper. Show your steps.

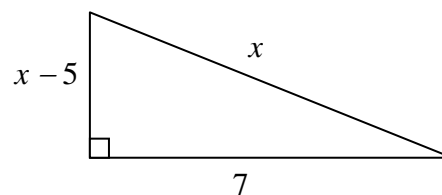
The maximum mark for each task is 3 marks.

7. Simplify $2x(3 - x) - 2x(x + 3)$.

8. Solve the equation $\sqrt{2 + \sqrt{x}} = 3$.

9. A square based cuboid has a volume of 80 cm^3 and the height of the cuboid is 5 cm. Find the total surface area of the cuboid.

10. Find the value of x .



11. The vertices of a triangle has the coordinates $(2,1)$, $(2,5)$ and $(7,2)$. What is the area of the triangle?

12. Anna and Mika are collecting strawberries. Anna collects 6 litres in 27 minutes and Mika 7 litres in 36 minutes. How long time does it take to collect 5 litres when they work together?

13. Simplify the expression $(x^2 + x)(x^2 - x)$ and find its value when $x = \frac{1}{\sqrt{2}}$.

14. We know that $\log_a b = c$ is the same as $a^c = b$.

Evaluate $\log_3 9$.
