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Test:

Sample Test A [Official Released Test]

Source:

https://www.lfhk.cuni.cz/Applicants/Undergraduate-Study/Admission-Process/Example-Test-and-Recommended-Literature/test2014_web.aspx/

Question 1

50 students wrote the test from math and physics. 5 students passed both tests, 10 students passed math test and 15 students passed physics test. What is the probability that the randomly selected student did not pass both tests?

- 1) 0.5
- 2) 0.1
- 3) 0.8
- 4) 0.6
- 5) 0.4

Question 2

Find the smallest integer constant **b** so that the quadratic equation $3x^2+5x-b=0$ has two real solutions.

- 1) -2
- 2) -1
- 3) -4
- 4) -5
- 5) -3

Question 3

What is the distance between the vertex of the parabola given by equation $y = x^2 - 4x + 2$ and its cross-section with x axis?

- 1) 3
- 2) $\sqrt{5}$
- 3) $\sqrt{6}$
- 4) $\sqrt{7}$
- 5) $\sqrt{8}$

Question 4

Find the maximum of the function $f(x) = x^3 - 3x^2 - 9x + 4$.

- 1) 9
- 2) 7
- 3) 8
- 4) 6
- 5) 10

Question 5

Let i is the imaginary unit defined as $i = \sqrt{-1}$. Simplify i^{95} .

- 1) -1
- 2) 0
- 3) -i
- 4) 1
- 5) i

Question 6

Find b and c so that a parabola with equation $y = 2x^2 - bx - c$ has a vertex in the point (2,3).

- 1) $b = -8, c = 10$
- 2) $b = -4, c = 12$
- 3) $b = 8, c = -11$
- 4) $b = 6, c = 8$
- 5) $b = 4, c = -11$

Question 7

The power function $y = x^n$, where n is an integer number, can be graphically expressed by:

- A) parabola
 - B) line
 - C) ellipse
 - D) hyperbola
- 1) all (A-D) are valid
 - 2) only C is valid
 - 3) A, B are valid
 - 4) none (A-D) is valid
 - 5) A, B, D are valid

Question 8

Simplify the following expression: $\ln(10^{-x \cdot \log e})^2 - \log(e^{-x \cdot \ln 10})$

- 1) -2x
- 2) x
- 3) -x
- 4) $x \cdot \ln 10$
- 5) $\log e$

Question 9

Let α be an angle (in standard position) in quadrant IV, whose terminal side is parallel to the line $3y + \sqrt{3}x - 3 = 0$. Find the exact values of $\sin \alpha$.

- 1) -0.7
- 2) 0.7
- 3) -0.5
- 4) 0.5
- 5) -0.3

Question 10

A volleyball team of 6 players (4 men, 2 women) is to be formed from a group of 6 men and 6 women. How many arrangements are possible?

- 1) 125
- 2) 144
- 3) 169
- 4) 15
- 5) 225

Answer Key:

1. 4
2. 1
3. 3
4. 1
5. 3
6. 3
7. 5
8. 3
9. 3
10. 5