Frankfurt School
of Finance & Management
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AC-Test Mathematics – Practice quiz

Exercise 1

Let a and b be real numbers. Which of the following expressions corresponds to $(a+2b)^2$?

- ☐ $a^2+2ab+4b^2$
- ☐ $a^2+4ab+4b^2$
- ☐ a^2+4b^2
- ☐ $a^2+2ab+2b^2$

Exercise 2

Let the functions $f(x)=x^2-1$ and$g(x)=-\frac{2}{x}$ be given. Calculate $f(g(4))$.

Exercise 3

Calculate the product of the solutions of the absolute value equation $|2x-1|=5$.

Exercise 4

Calculate $\log_2(32)-\log_3(81)$.

Exercise 5

Compute the sum of the solutions of the quadratic equation $7x^2+14x=19$.

Exercise 6

Calculate the product of all zeroes of $(x+4)(x^2-9)$.

Exercise 7

Let a and$b$ be real numbers. Which of the given expressions corresponds to $\max(a,b) - \min(a,b)$?

- ☐ $-|a-b|$
- ☐ $\dfrac{a+b+|a-b|}{2}$
- ☐ $\dfrac{a+b-|a-b|}{2}$
- ☐ $|b-a|$

(Here, $\max(a,b)$ denotes the maximum and$\min(a,b)$ the minimum of the two numbers a and$b$.)

Exercise 8

For $x \neq \{0,2\}$ simplify the expression $\dfrac{5x-10}{x^2-2x}$.

- ☐ $\dfrac{5}{x}$
- ☐ $\dfrac{5}{x-2}$
- ☐ $\dfrac{3x-10}{x^2}$
- ☐ The expression cannot be simplified further.

Exercise 9

Let a>0. Which of the following expressions corresponds to $\sqrt{a\sqrt{a^3}}$?

- ☐ $\sqrt[4]{a^3}$
- ☐ $\sqrt{a}$
- ☐ a
- ☐ $\sqrt[4]{a^5}$

Exercise 10

How many possibilities are there to place 4 (different) cars next to each other, taking into account the arrangement, in a corresponding number of parking spaces?

Exercise 11

You toss two fair coins. With what probability do you get “tails” on both coins?

Exercise 12

A quantity y develops over time $t \geq 0$ according to $y(t) = 5 \cdot 2^{t/3}$. At what time t has the value of y doubled compared to time 0?

- ☐ 2
- ☐ 15
- ☐ 5
- ☐ 3

Exercise 13

What is the value of the sum of the first 6 natural numbers $1 + 2 + \cdots + 6$?

Exercise 14

The passages marked by ... in a transcription of the binomial formulae have become unreadable. Calculate the product of the missing entries.

$(a + \ldots)^2 = a^2 + \cdots + 16$

- ☐ 16
- ☐ 32
- ☐ $32a$
- ☐ $16a$

Exercise 15

The parabola $y = x^2 - 5x + 4$ is given. Determine the sum of the x-values of the two zeros.