Classwork 13.B

Exercises

Caboara

Solve the following exercises.

1. **Polynomial gcd.** Compute, with the Euclidean algorithm, the gcd of
$$A(x) = x^4 - 5x^2 + 4 \qquad \text{and} \qquad B(x) = x^3 - 3x^2 + 2x$$
2. **Polynomial equations.** Solve $x^4 - 10x^2 + 9 = 0$.
3. **Parabolas.** Find the parabola $y = ax^2 + bx + c$ passing through the points $(0, 1)$, $(1, 0)$ and $(2, 1)$, and find its vertex.
4. **Circles.** Find the center and the radius of the circle $x^2 + y^2 + 2x - 4y - 20 = 0$, and its intersections with the line $r\colon 4x - 3y + 10 = 0$.
5. **Exponential equations.** Solve $3^{x+1} + 3^{1-x} = 10$.
6. **Logarithmic equations.** Solve $\log_2 x - \log_2(x - 3) = 2$.
7. **Trigonometry.** Knowing that $\sin\alpha = -\frac{4}{5}$ and $\frac{3\pi}{2} < \alpha < 2\pi$, compute $\cos\alpha$, $\tan\alpha$, $\sin 2\alpha$ and $\cos 2\alpha$.
8. **Trigonometric equations.** Solve $\tan^2 x = 3$.
9. **Trigonometric equations.** Solve $\sqrt{3}\sin x - \cos x = -1$ using the tangent of the half angle.
10. **Exponentials and trigonometry.** Solve $9^{\sin x} + 9^{-\sin x} = \frac{10}{3}$.