Classwork 13_D

Exercises

Caboara

Solve the following exercises.

1. **Polynomial gcd.** Compute, with the Euclidean algorithm, the gcd of

$$A(x) = x^4 + 2x^3 - 2x - 1 \qquad \text{and} \qquad B(x) = x^4 - 2x^2 + 1$$

   and then factor both polynomials.

2. **Parabolas.** Find the value of k for which the line $y = 2x + k$ is tangent to the parabola $y = x^2 - 4x + 7$, and find the point of tangency.

3. **Circles.** Find the circle with center on the x-axis passing through $A = (1, 3)$ and $B = (5, 1)$. Then write the tangent line to the circle at A.

4. **Exponential equations.** Solve $4^x + 6^x = 2 \cdot 9^x$.

5. **Logarithmic equations.** Solve $\log_2 x + \log_4 x + \log_8 x = 11$.

6. **Trigonometry.** Knowing that $\tan \frac{\alpha}{2} = \frac{1}{2}$, compute $\sin \alpha$, $\cos \alpha$, $\tan \alpha$ and $\sin 3\alpha$.

7. **Trigonometric equations.** Solve $\cos 2x = \cos x$.

8. **Trigonometric equations.** Solve $\sin x + \sqrt{3} \cos x = -\sqrt{3}$ using the tangent of the half angle.

9. **Trigonometric equations.** Solve $\cos^4 x - \sin^4 x = \frac{1}{2}$.