Classwork 13_F

Exercises

Caboara

Solve the following exercises.

1. **Polynomial gcd.** Compute, with the Euclidean algorithm, the gcd of
$$A(x) = x^6 - 1 \qquad \text{and} \qquad B(x) = x^4 - 1$$
2. **Parabolas.** Find the vertex of the parabola $y = x^2 - 2x - 3$ and its intersections with the line $y = x + 1$.
3. **Circles.** Write the equations of the two tangent lines to the circle $x^2 + y^2 = 25$ passing through the point $P = (7, 1)$.
4. **Exponential equations.** Solve $4^{x+1} - 9 \cdot 2^x + 2 = 0$.
5. **Logarithmic equations.** Solve $\log_2(x - 1) = \log_4(x + 5)$.
6. **Trigonometry.** Compute $\cos\frac{\pi}{8}$, $\sin\frac{\pi}{8}$ and $\tan\frac{\pi}{8}$ exactly.
7. **Trigonometric equations.** Solve $\sin\left(x + \frac{\pi}{3}\right) = \cos x$.
8. **Trigonometric equations.** Solve $\sin x - \sqrt{3}\cos x = \sqrt{3}$ using the tangent of the half angle.
9. **Logarithms and trigonometry.** Solve $\log_3(\sin x) - \log_3(\cos x) = \frac{1}{2}$.