



**REAL NUMBERS, POLYNOMIALS
AND FRACTIONS TEST - 4º ESO**



Exercise 1: (1 point) The distance between the Sun and the Earth is estimated to be of 149.6 million kilometers. Knowing that the light travels at a speed of 299800000 m/s, how long does it take the sunlight to reach our planet? Round the answer to minutes and seconds

Exercise 2: (1 point) Rationalize the following expressions:

a) $\frac{18}{\sqrt[9]{3^4}} =$

b) $\frac{2}{\sqrt{2}} =$

c) $\frac{\sqrt{8} + \sqrt{2}}{\sqrt{8} - \sqrt{2}} =$

Exercise 3: (0.75 points) The policy of a certain train company states that they will refund the ticket money if the train is a 10% or more late. The stipulated travelling time from Seville to Madrid is of two hours and thirty-seven minutes but yesterday it took us two hours and fifty-two minutes. Find the percentage error and tell me if I will get my money back.

Exercise 4: (0.75 points) Study the following unions and intersections of intervals:

a) $(-5, 7] \cup [-5, +\infty) =$

b) $[-5, -1] \cap (-2, 4) =$

Exercise 5: (1 point) Solve and factorize the equation $x^6 - 2x^5 - 15x^4 + 30x^3 - 16x^2 + 32x = 0$

Exercise 6: (2.75 points) Work out, express as a single radical and simplify if possible:

a) $7\sqrt[3]{625} - \sqrt[3]{320} + 2\sqrt[3]{1080} =$ (0.85)

b) $\frac{\sqrt[7]{2^{-5}} \cdot \sqrt{5}}{\sqrt[4]{2^3 \cdot 5^{-2}}} =$ (0.85)

c) $\sqrt[7]{a^5} : \sqrt[3]{a^{-2}} \cdot \sqrt{a^{-7}} =$ (0.65)

d) $2^{-9/4} \cdot 2^{4/3} : 2^{-1/7} =$ (0.4)

Exercise 7: (2.75 points) Work out the value of the following expressions and simplify if possible:

a) $\frac{2x}{x^2 - 4x + 3} + \frac{4}{3 - x} - \frac{x}{x^2 - 9} =$ (1.25)

b) $\frac{x^2 + 3x - 10}{x^2 - 9} \cdot \frac{x^2 + 6x + 9}{x^2 - 4} =$ (0.75)

c) $\frac{x^3 + 9x^2 + 8x}{x^2 - 10x + 25} : \frac{x^3 - x}{x^2 - 25} =$ (0.75)

