



FIRST TERM GLOBAL TEST- 4° ESO



Exercise 1: (1.5 ptos) Work out and express as intervals:

a) $\frac{3x-5}{2} - \frac{2x-4}{3} \leq \frac{4x+5}{4} \rightarrow x \in \left[\frac{-29}{2}, +\infty \right)$

b) $x^2 - 4x - 5 > 0 \rightarrow x \in (-\infty, -1) \cup (5, +\infty)$

Exercise 2: (2 ptos) Work out:

a) $\left. \begin{array}{l} xy = 4 \\ x^2 - 3y^2 = 13 \end{array} \right\} \rightarrow \begin{array}{ll} x = 4 & y = 1 \\ x = -4 & y = -1 \end{array}$

b) $\left. \begin{array}{l} x^2 + x - 20 < 0 \\ 9 - x^2 \leq 0 \end{array} \right\} \rightarrow x \in (-5, -3] \cup [3, 4)$

Exercise 3: (0.75 ptos) One of Santa's reindeers is feeling a little sick this year, so he is afraid that he won't be able to reach the needed speed with his sleigh in order to deliver all the presents before the kids wake up in the morning. He knows that he has to cover a total distance of $1.2 \cdot 10^5$ km, and the maximum average speed so far is of 1280 m/s. How many hours is it going to take them? **26 hours, so he won't be able to deliver all the presents, not even considering the different time zones :(**

Exercise 4: (1 pto) Rationalize:

a) $\frac{10}{\sqrt{5}} = 2\sqrt{5}$

b) $\frac{7}{\sqrt[3]{7}} = \sqrt[3]{7^4}$

c) $\frac{\sqrt{5} + \sqrt{20}}{\sqrt{5} - \sqrt{20}} = -3$

Exercise 5: (1 pto) Work out:

$\sqrt{2x+5} - \sqrt{x+2} = 1 \rightarrow x = \pm 2$ and both of them are valid solutions

Exercise 6: (2 ptos) Work out and simplify if possible:

a) $\frac{5x}{x^2-4} - \frac{4}{x^2+5x+6} + \frac{2x+1}{x^2+x-6} = \frac{7x^2+16x+10}{x^3+3x^2-4x-12}$

b) $\frac{x^2-4x-5}{x^2-1} \cdot \frac{x^2-10x+25}{x^2-8x+15} = \frac{x-3}{x-1}$

Exercise 7: (1 pto) Solve and factorize: $P(x) = x^5 + 9x^4 + 25x^3 + 27x^2 + 10x = 0$

$P(x) = x(x+1)^2(x+2)(x+5) \rightarrow$ Roots: $x = 0$, $x = -1$ double, $x = -2$, $x = -5$

Exercise 8: (0.75 ptos) Find the value of the constant a so that when dividing the polynomial $P(x) = x^4 + ax^3 + 4x^2 + 7x - 9$ by $(x+1)$ the remainder is $-10 \rightarrow a = -1$

