

**YOU & MATHS** Solve the inequality:

$$\frac{(x+1)(x-\sqrt{2})}{(x+5)^2} \geq 0$$

Express your answer in interval notation or graph your solution on the number line.

(USA Southern Illinois University Carbondale, Final Exam, 2001)

The given inequality is well defined if and only if  $(x+5)^2 \neq 0$ , equivalent to  $x \neq -5$ .

Let's solve the inequality:

$$(x+1)(x-\sqrt{2}) \geq 0.$$

We can find the solution using the following table.



The solution is:

$$x < -5 \text{ or } -5 < x \leq -1 \text{ or } x \geq \sqrt{2}.$$

We can show the solution in interval notation:

$$(-\infty, -5) \cup (-5, -1] \cup [\sqrt{2}, +\infty),$$

or with a graph:

	-5	1	$\sqrt{2}$	
segno di N				
$x+1$	-	-	+	+
$x-\sqrt{2}$	-	-	-	+
segno di D				
$(x+5)^2$	+	0	+	+
segno di $\frac{N}{D}$	+	<del>-</del>	+	-