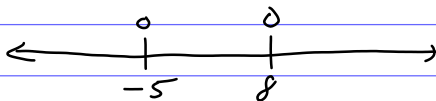First look at $(x+5)^3(x-8)^4 = 0$ ← not the orginal question

(times) ← times, =, 0 so we can split

$$(x+5)^3 = 0 \qquad (x-8)^4 = 0$$
$$\sqrt[3]{(x+5)^3} = \sqrt[3]{0} \qquad \sqrt[4]{(x-8)^4} = \sqrt[4]{0}$$
$$x+5 = 0 \qquad x-8 = 0$$
$$x = -5 \qquad x = 8$$

	$(-\infty, -5)$	$(-5, 8)$	$(8, \infty)$
$(x+5)^3$	$-$	$+$	$+$
$(x-8)^4$	$+$	$+$	$+$
$(x+5)^3(x-8)^4$	$-$	$+$	$+$

Now to answer the original question:

$$(x+5)^3(x-8)^4 < 0 \qquad \text{happens when } x \text{ is } (-\infty, -5)$$