

Higher-Degree Inequalities

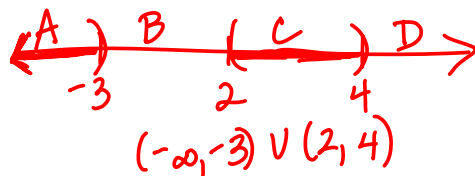
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Solve the inequality using the Boundary Number Method

$$(x + 3)(x - 2)(x - 4) < 0$$

$$(x + 3)(x - 2)(x - 4) = 0$$

$$\begin{array}{l} x + 3 = 0 \quad x - 2 = 0 \quad x - 4 = 0 \\ x = -3 \quad x = 2 \quad x = 4 \end{array}$$



$$A: x = -4$$

$$\begin{aligned} (-4 + 3)(-4 - 2)(-4 - 4) < 0 \\ (-1)(-6)(-8) < 0 \\ -48 < 0 \quad T \end{aligned}$$

$$B: x = 0$$

$$\begin{aligned} (0 + 3)(0 - 2)(0 - 4) < 0 \\ (3)(-2)(-4) < 0 \\ 24 < 0 \quad F \end{aligned}$$

$$C: x = 3$$

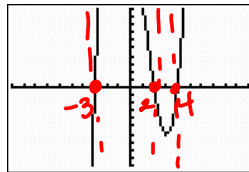
$$\begin{aligned} (3 + 3)(3 - 2)(3 - 4) < 0 \\ (6)(1)(-1) = -6 < 0 \quad T \end{aligned}$$

$$D: x = 5 \quad (5 + 3)(5 - 2)(5 - 4) < 0 \quad F$$

Use calculator to check

$$(x+3)(x-2)(x-4) < 0$$

Plot1	Plot2	Plot3
Y1	(X+3)(X-2)(X-4)	
Y2	=	
Y3	=	
Y4	=	
Y5	=	
Y6	=	



below above
below above
3 2 below

X	Y1
-4	-48
-3	0
-2	24
-1	30
0	24
1	12
2	0

X	Y1
3	12
4	0
5	-6
6	0
7	24
8	72
9	150

Solve

$$x(x+2)(x-2) \geq 0$$

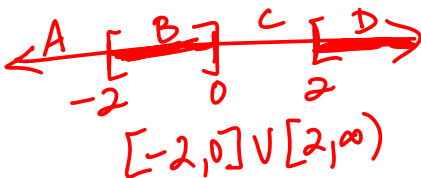
A: $x = -3$ $-3(-3+2)(-3-2) \geq 0$
 $-3(-1)(-5) \geq 0$ F

$$x(x+2)(x-2) = 0$$

B: $x = -1$ $-1(-1+2)(-1-2) \geq 0$
 $-1(1)(-3) \geq 0$ T

$x = 0$ $x+2=0$ $x-2=0$
 $x = -2$ $x = 2$

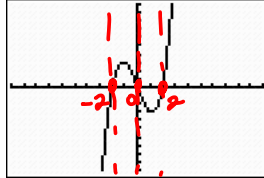
C: $x = 1$ $1(1+2)(1-2) \geq 0$
 $1(3)(-1) \geq 0$ F



D: $x = 3$ $3(3+2)(3-2) \geq 0$
 $3(5)(1) \geq 0$ T

Use calculator to check $x(x+2)(x-2) \geq 0$

Plot1 Plot2 Plot3
Y1 $X(X+2)(X-2)$
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
Y7 =



y

X	Y1	
-3	-15	
-2	0	✓
-1	-3	
0	0	✓
1	15	✓
2	0	
3	15	

X = -3

below -2 above 0 below 2 above