1

An algebrical approach:

first of all (A) a<b and (C) a+c<b+c are the same: both tell us that $a<b$.
Since exactly one inequality is false, both A and C must be true. With $a<b$ enstablished we can focus on

(B) c<d

(D) a+c<b+d

(E) a<b+c+d

E must be true since $a<b$ also $a<b+(+veNumber)+(+veNumber)$ is true as well.

(B) $0<d-c$
(D) $a-b<d-c$ but since a-b is negative => $-ve<d-c$

(B) $d-c>0(>-ve)$ number
(D) $d-c>-ve$ number

if B is true, also D is true for sure ($d-c=7$ $7>-ve$ and $7>0$) this goes against the text of the question
if D is true, B could be false ($d-c=-1$ $-1>-ve(-2)$(for example) and $-1>0$ FALSE)
Hence B must be the false inequality

Simpler approach: given $a<b$ if B is true $c<d$ also D is true
$a+c<b+d$, once more this is against the question

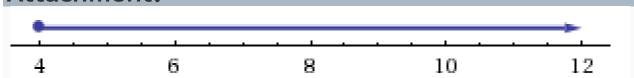
Answer: B

2

Which of the following inequalities has a solution set that, when graphed on a number line, is a single, finite line segment?

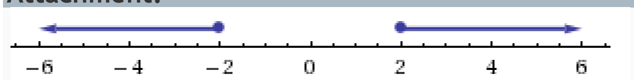
A. x>=4 --> this inequality clearly has **one infinite solution set**:

Attachment:



B. x^2>=4 --> this inequality has **two infinite solution sets**, $x\leq-2$ and $x\geq 2$:

Attachment:



C. x^3>=64 --> this inequality has **one infinite solution set**, $x\geq 4$:

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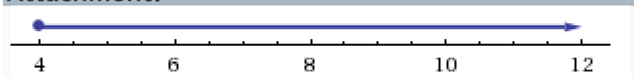

D. |x|>=4 --> this inequality has **two infinite solution sets**, $x \leq -4$ and $x \geq 4$:

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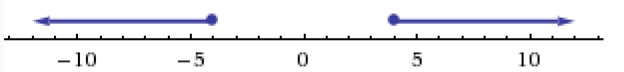

E. |x|<=4 --> this inequality has **one finite solution set**, $-4 \leq x \leq 4$:

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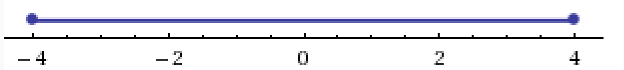

Answer: E.

3

Since n denotes a number to the left of 0 on the number then n is negative, so it can not be 4 as you assumed.

Next, **when you multiply (or divide) an inequality by a negative number you must flip the sign of the inequality**.

So, for $n>-\frac{1}{10}$ --> multiply by negative -10 and flip the sign: $-10n<1$ --> divide by negative n and flip the sign again: $-10>\frac{1}{n}$.

4

Actually you can transform it to an absolute value problem: $1-x^2 \geq 0$ --> $x^2 \leq 1$, since both parts of the inequality are non-negative then we can take square root: $|x| \leq 1$ --> $-1 \leq x \leq 1$.

Now, other approach would be: $1-x^2 \geq 0$ --> $x^2-1 \leq 0$ --> $(x+1)(x-1) \leq 0$ --> the roots are -1 and 1 --> "<" sign indicates that the solution lies between the roots, so $-1 \leq x \leq 1$.

we have $(x+1)(x-1) \leq 0$, so the product of two multiples is less than (or equal to) zero, which means that the multiples must have opposite signs. Then x2suresh checks the case A. when the first multiple (x+1) is negative and the second (x-1) is positive and the case B. when the first multiple (x+1) is positive and the second (x-1) is negative to get the range for which $(x+1)(x-1) \leq 0$ holds true. Notice that, for this particular problem, we don't realy need to test case A, since it's not possible (x+1), the larger number, to be negative and (x-1), the smaller number to be positive. As for case B, it gives: $x+1 \geq 0$ and $x-1 \leq 0$ --> $x1 \geq -1$ and $x \leq 1$ --> $-1 \leq x \leq 1$.

Answer: E

5

Think of the cases in which $x<y<z$ but $x^2>y^2>z^2>0$ happens.

A simple case I can think of is all negative numbers: -5 < -4 < -3 but 25 > 16 > 9 > 0
Another thing that comes to mind is that z can be positive as long as its absolute value remains low: -5 < -4 < 3 but 25 > 16 > 9 > 0

We need to find the option that must stay positive:

A. $x^3\ y^4 z^5$

Will be negative in this case: -5 < -4 < 3
i.e. x negative, y negative, z positive

B. $x^3y^5z^4$
Will be positive in both the cases.

C. $x^4y^3z^5$
Will be negative in this case: -5 < -4 < 3
i.e. x negative, y negative, z positive

D. $x^4y^5z^3$
Will be negative in this case: -5 < -4 < 3
i.e. x negative, y negative, z positive

E. $x^5y^4z^3$
Will be negative in this case: -5 < -4 < 3
i.e. x negative, y negative, z positive

Notice that for an expression to stay positive, we need the power of both x and y to be either even or both to be odd since x and y are both negative. Also, we need the power of z to be even so that it doesn't affect the sign of the expression. Only (B) satisfies these conditions. We don't need to consider any other numbers since we have already rejected 4 options using these numbers. The fifth must be positive in all cases.

OR

First of all: $x^2>y^2>z^2>0$ means that $|x|>|y|>|z|>0$ (we can take even roots from all parts of an inequality, if all parts are non-negative).

Thus we have that $x<y<z$ and $|x|>|y|>|z|>0$. This implies that both x and y must be negative numbers: x to be less than y and at the same time to be further from zero than y is, it must be negative. The same way y to be less than z and at the same time to be further from zero than z is, it must be negative. Notice here, that z may be positive as well as negative. For example if $x=-3$, $y=-2$, then z can be -1 as well as 1. Since we don't know the sign of z, then in order to ensure (to guarantee) that the product will be positive its power in the expression must be even. Only answer choice B fits.

Answer: B.