Divide using synthetic division.

1. $(x^3 + 4 - 11x + 3x^2) \div (6 + x)$ $(x+6)!$.

2. $(x^4 - 11x^3 - 45x^2 + 77x + 68) \div (x + 4)$

~~Solve the equation by graphing.~~

~~$x^2 + 8x + 21 = 0$~~

Dec 6th 12:06:29 am

Nice to see you again. ☺ A tutor will be with you any moment.

Dec 6th 12:06:31 am

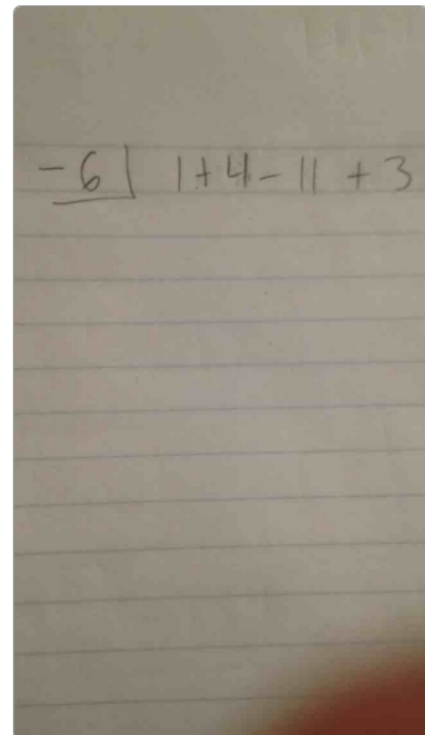TUTOR FOUND, NOW REVIEWING PROBLEM AT NO CHARGE

Dec 6th 12:06:34 am

SESSION STARTED AT 4:06 PM

Dec 6th 12:06:55 am

Hi Sydney! Welcome back! I'm Ms. Herring, your tutor for this session. This is an interesting problem! In no time, you'll be able to solve problems like these all by yourself. Are you ready?

Dec 6th 12:07:17 am ✓ *Introduction: Tutor greets student by name and introduces himself by last name*

(Student proactively shares their progress and knowledge gap)

Dec 6th 12:07:46 am

Yep :) so I know this is the one where it starts off like this right?

Dec 6th 12:07:46 am

That's the idea, yep!

Dec 6th 12:08:11 am

I keep getting confused with what to multiple and what to add

Dec 6th 12:08:29 am

Okay! Let's go through this step by step, then!

Dec 6th 12:08:42 am ✓ *C2: Use of "we / let's / us" language*

First, let's get the number we're dividing into ordered by power!

Dec 6th 12:09:38 am ✓ *B2: Provide approach upfront*

You mean -6?

Dec 6th 12:09:54 am

No, the other one! The number that starts with x^3

Dec 6th 12:10:22 am ✓ *C1: Redirect student error*

Oh lol alright

Dec 6th 12:10:38 am

The problem gives it to us in a mixed order; we need it in descending order

Dec 6th 12:10:41 am ✓ *B2: Clarifies step further*

So from biggest to smallest with the variables?

Dec 6th 12:11:05 am

Right! The powers should decrease.

Dec 6th 12:11:17 am ✓ *B2: Tutor builds on student's thoughts*

Dec 6th 12:11:38 am

That's the right order! Great job!

Dec 6th 12:11:56 am ✓ *C2: Positive language*
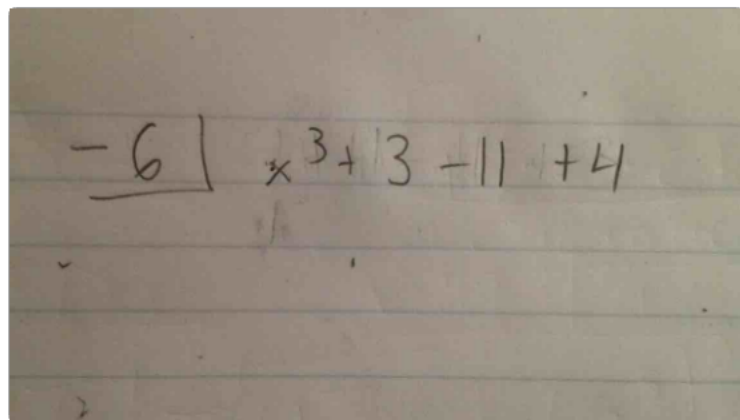
Do we bring down one and add it to 3?

Dec 6th 12:12:35 am

We do bring down 1, yes, but we don't add it to 3.

Dec 6th 12:12:47 am ✓ *C1: Adapt instruction to student gap*

Can you draw a line underneath the numbers you've written, horizontally, with enough space between the numbers and the line for another row?

Dec 6th 12:13:22 am

That'll make it easier for us to avoid errors later!

Dec 6th 12:13:31 am

Alright got it down :)

Dec 6th 12:13:47 am

Also, where you've written x^3, make sure you write the coefficient rather than the number!

Dec 6th 12:14:00 am ✓ *B1/C1: Redirect student error*

Yea I wrote it into a one after I realized that,

Dec 6th 12:14:27 am

Okay, great! You talked about bringing down the 1, so I thought you might have!

Dec 6th 12:14:43 am ✓ *C2: Positive language*

So first thing we do is, as you said, bring down the 1. Go ahead and bring it down below the horizontal line!

Dec 6th 12:15:05 am ✓ *B2/C3: Guide student towards next step*

Got it

Dec 6th 12:15:27 am

Great! Do you know what we should do next?

Dec 6th 12:15:44 am ✓ *C3: Invite student input*

Multiply 6?

Dec 6th 12:16:08 am

Yep! Multiply 1*-6 and write it below the second number, above the horizontal line!

Dec 6th 12:16:28 am ✓ *B2: Tutor builds on student's thoughts*

Alright, I got -3

Dec 6th 12:16:51 am

Awesome! Do you know what to do next, or have any ideas?

Dec 6th 12:17:05 am ✓ *C3: Invite student input*

Do we multiple -3 by -6?

Dec 6th 12:17:22 am

We do! Where do we write it?

Dec 6th 12:17:29 am ✓ *C3: Guiding question*

Under -11

Dec 6th 12:17:36 am

Yep! Above the horizontal line.

Dec 6th 12:17:44 am

And next?

Dec 6th 12:17:47 am ✓ *C3: Invite student input*

Put the 18 below 11?

Dec 6th 12:18:15 am

Well, right now we're in the third column, which from the top has -11 and then 18. What do we do with those numbers?

Dec 6th 12:18:50 am ✓ *C1: Adapts with follow-up question*

Oh woops XD it equals 7

Dec 6th 12:19:44 am

Ah, I understand now! Yes, it does!

Dec 6th 12:19:54 am ✓ *C2: Positive language*

Then the same for the next column?

Dec 6th 12:20:01 am

It depends what you mean by the same! Can you say a bit more, please?

Dec 6th 12:20:14 am ✓ *C3: Ask student to explain their thought process*

Multiple 7 but -5 then put the answer under 4

Dec 6th 12:20:31 am

Are you sure -5 is the right number? What number are we testing?

Dec 6th 12:20:46 am ✓ *C1: Adapts with follow-up question*

Wrong button XD

Dec 6th 12:21:06 am

Other than that, yes!

Dec 6th 12:21:08 am

Ah, okay! Typos are easy to make!

Dec 6th 12:21:24 am ✓ *C2: Reassuring language*

Then it should -45

Dec 6th 12:21:30 am

Hmm. What is -6*7?

Dec 6th 12:21:45 am

And then +4?

Dec 6th 12:21:55 am

✓ *C1/C3: Adapted guidance*

Lol it's 49 but plus the 4 is -45

Dec 6th 12:22:17 am

-6*7 is not 49 - can you try that again?

Dec 6th 12:22:36 am

49 is 7*7, actually!

Dec 6th 12:22:45 am

Oh 32

Dec 6th 12:22:55 am

42

Dec 6th 12:22:57 am

Yep!

Dec 6th 12:23:00 am

-42+4 is?

Dec 6th 12:23:08 am ✓ **C3: Guiding question**

38!

Dec 6th 12:23:21 am

Awesome, great job!

Dec 6th 12:23:27 am ✓ **C2: Positive language**

And that's the last column! What can you tell from this result?

Dec 6th 12:23:40 am ✓ **C3: Invite student input**

Great job, Sydney!

Dec 6th 12:23:53 am

Thanks lol, and the result is x^3 -3x +7 +38

Dec 6th 12:24:38 am

Not quite - the -38 is a remainder!

Dec 6th 12:24:54 am

✓ **C2: Acknowledge student's mistake without causing stress**

Can you check your powers again?

Dec 6th 12:25:12 am

Oh I forgot about remainders on this chapter, so it would be x^3 -3x^2 +7x, 38

Dec 6th 12:25:59 am

Well, we actually divided by (x+6)

Dec 6th 12:26:15 am

So the powers all need to go down one, because everything's been divided by x once! And then we can express the remainder of -38 as -38/(x+6). Does that make sense?

Dec 6th 12:26:47 am

✓ **B2/C1: Adapt explanation to student's gap**

I think so, how would that look written down?

Dec 6th 12:27:18 am

We look at the bottom row, but it's like the powers slide to the left one. It's x^2-3x+7-38/(x+6) - you were very close, just a minor error there!

Dec 6th 12:28:20 am

Does the whole process make more sense now?

Dec 6th 12:28:56 am ✓ **C1: Check with the student to ensure understanding**

Alrighty, is the / by -38 a remainder sign or just divided by x-6?

Dec 6th 12:29:09 am

-38/(x-6)

Dec 6th 12:29:24 am

Because it's a remainder, we can't simplify it anymore. We can either say remainder -38, or we can express it as a fraction - either works!

Dec 6th 12:29:49 am ✓ *B2: Explain rationale behind step*

Alrighty thanks :) that's all I need

Dec 6th 12:30:15 am

Sure! Please feel free to start another session if you need help later. Have a great day, and great work!

Dec 6th 12:30:33 am ✓ *Conclusion: Invites student back, warm send off*

Student ended session

Dec 6th 12:30:39 am