

1 Which is a possible list of possible roots of the function $f(x) = 3x^3 - 15x^2 + 12x - 6$?

A) $\{\pm 3, \pm 15\}$
 B) $\{\pm 1, \pm 3, \pm 5\}$
 C) $\{\pm 1, \pm 3, \pm 5, \pm 15\}$
 D) $\{\pm 1, \pm 3, \pm 5, \pm 15, \pm 1/3, \pm 1/5, \pm 1/15\}$
 E) $\{\pm 1, \pm 3, \pm 5, \pm 15, \pm 1/3, \pm 1/5, \pm 1/15, \pm 1/2, \pm 1/4, \pm 1/6, \pm 1/12\}$

3 What is a possible list of possible roots of the function $f(x) = -6x^3 + 9x^2 - 3x + 2$?

A) $\{\pm 2, \pm 6\}$
 B) $\{\pm 1, \pm 2, \pm 3, \pm 6\}$
 C) $\{\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{6}\}$
 D) $\{\pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{6}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{6}\}$
 E) $\{\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{6}, \pm \frac{1}{12}\}$

6 Which value is a possible root of the polynomial function $f(x) = 2x^3 - 12x^2 + 18x - 6$?

A) 2
 B) -12
 C) $-\frac{2}{9}$
 D) $\frac{3}{4}$
 E) $-\frac{8}{3}$

10 If the possible roots for the given functions below are placed in the diagram, which letter could represent the location of $-\frac{2}{3}$?

$p(x) = -8x^3 - 2x^2 + 11x + 6$ $q(x) = 15x^3 + x^2 - 8x - 4$

A) A they are new besties
 B) B they are that awesome
 C) C they won a free vacation
 D) D they were making a reel

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RATIONAL ZERO

Theorem

MATH LIB ACTIVITY



RATIONAL ZERO THEOREM

"Math Lib" Activity!

Objective: Students will use the Rational Zero Theorem (or Rational Root Theorem) to identify all possible roots for a given polynomial function with this "Math Lib" Activity.

Activity Directions: Print and post the ten stations around the room. Give each student the worksheet to record their work as they travel to the stations. Group students (I typically do groups of 3) and assign to a starting problem. Set the timer for 3 minutes (more if needed). Students solve the problem at the station, then look for their answer and record the piece to the story. When the timer goes off, they move to the next station.

You can edit each slide to change the teacher names and all story elements to personalize for your students. PowerPoint is required to edit the slides. They enjoy seeing which one of their teachers is the "star" of the story!

1 Which is a complete list of possible roots of the polynomial function?
 $f(x) = 3x^3 + 10x^2 + 15x + 6$

A) $\{\pm 3, \pm 15\}$
B) $\{\pm 1, \pm 3, \pm 5, \pm 15\}$
C) $\{\pm 1, \pm 3, \pm 5, \pm 15, \pm \frac{1}{3}, \pm \frac{1}{5}, \pm \frac{1}{15}\}$
D) $\{\pm 1, \pm 3, \pm \frac{1}{3}, \pm \frac{1}{5}, \pm \frac{1}{15}, \pm 3, \pm 5, \pm 15\}$
E) $\{\pm 1, \pm 3, \pm 5, \pm 15, \pm \frac{1}{3}, \pm \frac{1}{5}, \pm \frac{1}{15}\}$

3 Which is a complete list of possible roots of the polynomial function?
 $f(x) = -6x^3 + 11x^2 - 6x + 6$

A) $\{\pm 2, \pm 6\}$
B) $\{\pm 1, \pm 2, \pm 3, \pm 6\}$
C) $\{\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{2}, \pm \frac{3}{2}\}$
D) $\{\pm 1, \pm 2, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{6}\}$
E) $\{\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{6}\}$

6 Which value is a possible zero of a polynomial function with the leading coefficient 2 and constant term -12?

A) 2
B) -12
C) $-\frac{2}{9}$
D) $\frac{3}{4}$
E) $-\frac{8}{3}$

10 If the possible roots for the given functions below are placed in the diagram, which letter could represent the location of $-\frac{2}{3}$?

$p(x) = -8x^3 - 2x^2 + 11x + 6$ $q(x) = 15x^3 + x^2 - 8x - 4$

A B C D

A) A they are new besties
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10 Stations & Student Worksheet Included
You can change ALL story elements!