

Factoring Practice

Unlimited Practice for Polynomial Factoring.

NOTE: These are all randomized problems. As a result, it is entirely possible to get pretty awful numbers if you are suitably unlucky. Some of these may look bad until you start doing them, but if you see problems that look excessively awful, remember that you can always hit the ‘Another’ button in the top (green refresh arrow) to get new numbers. If you find yourself doing this frequently, you may want to discuss it with your TA to see if you have a gap in your understanding, or to see if the problems are just really that bad (in which case the TA will forward the info to the content authors).

Problem 1 Fully factor the following polynomial (Hint: You likely need to use Rational Root Theorem to find at least one factor)

$$p(x) = x^4 - 27x^2 + 14x + 120$$

The smallest (most negative) zero is:

The largest (most positive) zero is:

The sum of the zeros of $p(x)$ is:

Problem 2 Fully factor the following polynomial (Hint: You likely need to use Rational Root Theorem to find at least one factor)

$$p(x) = x^4 + 9x^3 + 26x^2 + 24x$$

The smallest (most negative) zero is:

The largest (most positive) zero is:

The sum of the zeros of $p(x)$ is:

Problem 3 Fully factor the following polynomial (Hint: You likely need to use Rational Root Theorem to find at least one factor)

$$p(x) = x^4 - 3x^3 - 21x^2 + 83x - 60$$

The smallest (most negative) zero is:

The largest (most positive) zero is:

The sum of the zeros of $p(x)$ is:

Problem 4 Fully factor the following polynomial using real coefficients.

$$p(x) = 3x^6 + 13x^5 - x^4 + 39x^3 - 24x^2 + 26x - 20$$

How many real-valued zeros does $p(x)$ have?

What is the sum of the real-valued zeros?

How many non-real-valued zeros does $p(x)$ have?

Problem 5 Fully factor the following polynomial using real coefficients.

$$p(x) = x^6 - 3x^5 - 2x^4 - 6x^3 - 7x^2 - 3x - 4$$

Learning outcomes:

How many real-valued zeros does $p(x)$ have?

What is the sum of the real-valued zeros?

How many non-real-valued zeros does $p(x)$ have?

Problem 6 Fully factor the following polynomial using real coefficients.

$$p(x) = -4x^6 + 24x^5 - 44x^4 + 144x^3 - 156x^2 + 216x - 180$$

How many real-valued zeros does $p(x)$ have?

What is the sum of the real-valued zeros?

How many non-real-valued zeros does $p(x)$ have?
