

## 1 Sum and difference central coefficients

1. Solve for the roots by factors and sketch the graphs.

a)

$$(x + 1)(2x + 3) = 2x^2 + 5x + 3$$

d)

$$2x^2 + 13x + 11$$

b)

$$2x^2 + 7x + 5$$

e)

$$2x^2 + 15x + 13$$

c)

$$2x^2 + 9x + 7$$

f)

$$3x^2 + 8x + 5$$

2. Notice in the last question the outer coefficients sum to the central coefficient. Put where is the  $x^2$  coefficient in your roots? How about the constant coefficient? Hint: Use the words numerator and denominator in your answers.

3. Central Sum negated cases. Solve for the roots by factors and sketch the graphs.

a)

$$3x^2 - 10x + 7$$

d)

$$5x^2 - 12x + 7$$

b)

$$3x^2 - 14x + 11$$

e)

$$5x^2 - 16x + 11$$

c)

$$3x^2 - 16x + 13$$

f)

$$5x^2 - 18x + 13$$

4. In each case above both roots have the same sign? Are they both positive or both negative? What sign pattern quadratic gives two positive roots?

5. Central Difference Cases. Solve for the roots by factors and sketch the graphs.

a)

$$3x^2 - 4x - 7$$

d)

$$5x^2 - 2x - 7$$

g)

$$7x^2 + 4x - 11$$

b)

$$3x^2 - 8x - 11$$

e)

$$5x^2 - 6x - 11$$

h)

$$7x^2 + 6x - 13$$

c)

$$3x^2 - 10x - 13$$

f)

$$5x^2 - 8x - 13$$

i)

$$11x^2 + 2x - 13$$

6. In each case above constant coefficient of the quadratic is negative? Are the signs of the roots mixed or same?