

Write a polynomial function, P , in **factored form** and in **standard form** using the given zeros.

1. zeros: 2, 1, 4

$$P(x) = (x-2)(x-1)(x-4) \quad \text{factored form}$$

$$x^2 - x - 2x + 2$$

$$(x^2 - 3x + 2)(x-4)$$

$$x^3 - 3x^2 + 2x - 4x^2 + 12x - 8$$

Standard form

$$P(x) = x^3 - 7x^2 + 14x - 8$$

Write a polynomial function, P , in **factored form** and in **standard form** using the given zeros.

2. zeros: -6, 3, 5

$$P(x) = (x+6)(x-3)(x-5) \quad \text{factored form}$$

$$x^2 - 3x + 6x - 18$$

$$(x^2 + 3x - 18)(x-5)$$

$$x^3 + 3x^2 - 18x - 5x^2 - 15x + 90$$

Standard form

$$P(x) = x^3 - 2x^2 - 33x + 90$$

Write a polynomial function, P , in **factored form** and in **standard form** using the given zeros.

3. zeros: $5, -3i, 3i$

factored form $P(x) = (x-5)(x+3i)(x-3i)$ $i^2 = -1$

$$x^2 - 3ix + 3ix - 9i^2$$

$$x^2 - 9(i^2) \rightarrow -1$$

$$(x-5)(x^2+9)$$

$$x^3 + 9x - 5x^2 - 45$$

standard form

$$P(x) = x^3 - 5x^2 + 9x - 45$$

Write a polynomial function, P , in **factored form** and in **standard form** using the given zeros.

4. zeros: $i, 2i, -i, -2i$

factored form $P(x) = (x-i)(x+i)(x-2i)(x+2i)$

$$x^2 + ix - ix - i^2$$

$$x^2 + 2ix - 2ix - 4i^2$$

$$x^2 - i^2 \rightarrow -1$$

$$x^2 - 4i^2 \rightarrow -1$$

$$(x^2+1)(x^2+4)$$

$$x^4 + 4x^2 + 1x^2 + 4$$

standard form

$$P(x) = x^4 + 5x^2 + 4$$