3.4 WS 2

Find all the zeros of the polynomial function and write the polynomial as a product of its leading coefficient and its linear factors.

1. $P(x) = x^4 - 4x^3 + 53x^2 - 196x + 196$

2. $P(x) = x^3 - 13x^2 + 65x - 125$

3. $P(x) = 3x^4 - 10x^3 + 15x^2 + 20x - 8$

4. $P(x) = 3x^5 + 2x^4 + 10x^3 + 6x^2 - 25x - 20$

Use the given zero to find the remaining zeros of each polynomial function.

5. $P(x) = x^4 - 4x^3 + 14x^2 - 4x + 13; \quad 2 - 3i$

6. $P(x) = 3x^3 - 29x^2 + 92x + 34; \quad 5 + 3i$

Find the polynomial function *P*, with real coefficients, that has the indicated zeros and satisfies the given conditions.

7. Zeros: $i,\ 0;$ degree 3

8. Zeros: $3 + i,\ 2 - 5i;$ degree 4

9. Zeros: $3 + 2i,\ 7;$ degree 3

10. Zeros: $-2, 1, 3,\ 1 + 4i;$ degree 5