

### 3.4C Writing Equations of Polynomials

### ANSWER KEY

Write the lowest degree polynomial function with the information given. There should be no "i" in your answer.

1. Zeros:  $\frac{1}{2}$ , 6, -2      y intercepts is 3

$$f(x) = \frac{1}{2}\left(x - \frac{1}{2}\right)(x - 6)(x + 2) \text{ OR}$$

$$f(x) = \frac{1}{4}(2x - 1)(x - 6)(x + 2)$$

3. roots: 4, -5, 2 (double root)     $f(0) = -80$

$$f(x) = (x - 4)(x + 5)(x - 2)^2$$

5. Zeros: -4, i     $f(-3) = 60$

$$f(x) = 6(x + 4)(x^2 + 1)$$

7. Roots: 1, 5i,     $f(-1) = -104$

$$f(x) = 2(x - 1)(x^2 + 25)$$

9. Zeros 2i, -2 (double root), 5    y intercept of 80

$$f(x) = -2(x^2 + 4)(x + 2)^2(x - 5)$$

11. Zeros: -5,  $4 + 3i$      $f(2) = 91$

$$f(x) = (x + 5)(x^2 - 8x + 25)$$

Write the equation for the graphs

13. Zeros:  $x = -1$  (bounce), 2, 3 (bounce)  
Other point (0, 18)

$$f(x) = -(x + 1)^2(x - 2)(x - 3)^2$$

2. Zeros: 1, 3, -1      y intercept is 3

$$f(x) = (x - 1)(x - 3)(x + 1)$$

4. Roots: 1 (triple root), -5       $f(2) = -21$

$$f(x) = -3(x - 1)^3(x + 5)$$

6. Zeros: 3, -4, i     $f(2) = 25$

$$f(x) = -\frac{5}{6}(x - 3)(x + 4)(x^2 + 1)$$

8. Roots: 3, 4, 2i,     $f(-1) = -50$

$$f(x) = -\frac{5}{6}(x - 3)(x + 4)(x^2 + 4)$$

10. Zeros: -2, -1, 3,     $f(0) = 3$

$$f(x) = -\frac{1}{2}(x + 2)(x + 1)(x - 3)$$

12. Roots: -2, 5,  $3 + 2i$ ,       $f(1) = -96$

$$f(x) = (x + 2)(x - 5)(x^2 + 5x + 13)$$

14. Zeros:  $x = 3$ , 8 (bounce)

Other point: (4, -16)

$$f(x) = -(x - 3)(x - 8)^2$$

