

Algebra II  
Polynomial 5.7

Name \_\_\_\_\_

Directions: Sketch the polynomials using the degree, correct end behavior, zeros, multiplicities and y-intercept.

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

2)  $y = -2(x - 1)^2(x + 4)(x - 5)$

Directions: Factor first, then sketch as above.

3)  $f(x) = -2x^5 + 14x^4 - 24x^3$

4)  $y = x^4 - 50x^2 + 49$

Recall:

For any polynomial  $P(x)$

- $(x - k)$  is a linear factor of the polynomial  $P(x)$
- $k$  is a zero of the function  $y = P(x)$ , written  $f(k) = 0$
- $k$  is a root (or solution) of the equation  $P(x) = 0$
- $(k, 0)$  is an  $x$ -intercept of the graph of  $y = P(x)$

Use this information to complete the table.

| Factor     | Zero              | Solution / Root | $x$ intercept |
|------------|-------------------|-----------------|---------------|
| $(x - k)$  | $f(k) = 0$        | $x = k$         | $(k, 0)$      |
| $(x - 3)$  |                   |                 |               |
|            | $f(5) = 0$        |                 |               |
|            |                   | $x = 2$         |               |
|            |                   |                 | $(4, 0)$      |
|            |                   |                 | $(-1, 0)$     |
|            |                   | $x = -7$        |               |
|            | $f(-6) = 0$       |                 |               |
| $(3x + 4)$ |                   |                 |               |
|            | $f(\sqrt{5}) = 0$ |                 |               |
|            |                   | $x = -4i$       |               |