Answer Key · Lesson 4.7: Graphing Polynomial Functions

School Launch · Algebra II · Unit 4 · Worksheet A · for the parent

Key

1. -1: cross; 0: cross; 4: touch; y-int 0

For $f(x) = x\,(x-4)^2\,(x+1)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

2. -2: cross; 0: touch; 3: cross; y-int 0

For $f(x) = -x^2\,(x-3)\,(x+2)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

3. -3: touch; 2: touch; 3: cross; y-int 108

For $f(x) = -\,(x-3)\,(x-2)^2\,(x+3)^2$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

4. -4: touch; -3: touch; 2: touch; y-int 576

1. $x = -4$: multiplicity 2 (even → touch); $x = -3$: multiplicity 2 (even → touch); $x = 2$: multiplicity 2 (even → touch)
2. $f(0) = 576$

For $f(x) = (x-2)^2\,(x+3)^2\,(x+4)^2$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

5. -3: cross; 0: cross; 1: cross; y-int 0

1. $x = -3$: multiplicity 1 (odd → cross); $x = 0$: multiplicity 1 (odd → cross); $x = 1$: multiplicity 1 (odd → cross)
2. $f(0) = 0$

For $f(x) = -x\,(x-1)\,(x+3)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

6. -4: cross; -2: cross; 0: touch; y-int 0

1. $x = -4$: multiplicity 1 (odd → cross); $x = -2$: multiplicity 1 (odd → cross); $x = 0$: multiplicity 2 (even → touch)
2. $f(0) = 0$

For $f(x) = -x^2\,(x+2)\,(x+4)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

7. -4: touch; 0: cross; 2: cross; y-int 0

1. $x = -4$: multiplicity 2 (even → touch); $x = 0$: multiplicity 1 (odd → cross); $x = 2$: multiplicity 1 (odd → cross)
2. $f(0) = 0$

For $f(x) = x\,(x-2)\,(x+4)^2$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

8. -4: cross; 0: cross; 4: touch; y-int 0

1. $x = -4$: multiplicity 1 (odd → cross); $x = 0$: multiplicity 1 (odd → cross); $x = 4$: multiplicity 2 (even → touch)
2. $f(0) = 0$

For $f(x) = -x\,(x-4)^2\,(x+4)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

9. -4: touch; -3: touch; 2: cross; y-int 288

1. $x = -4$: multiplicity 2 (even → touch); $x = -3$: multiplicity 2 (even → touch); $x = 2$: multiplicity 1 (odd → cross)
2. $f(0) = 288$

For $f(x) = -\,(x-2)\,(x+3)^2\,(x+4)^2$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.

10. -4: cross; -3: cross; 4: touch; y-int -192

1. $x = -4$: multiplicity 1 (odd → cross); $x = -3$: multiplicity 1 (odd → cross); $x = 4$: multiplicity 2 (even → touch)
2. $f(0) = -192$

For $f(x) = -\,(x-4)^2\,(x+3)\,(x+4)$, give each zero and whether the graph crosses or touches the x-axis there, plus the y-intercept.