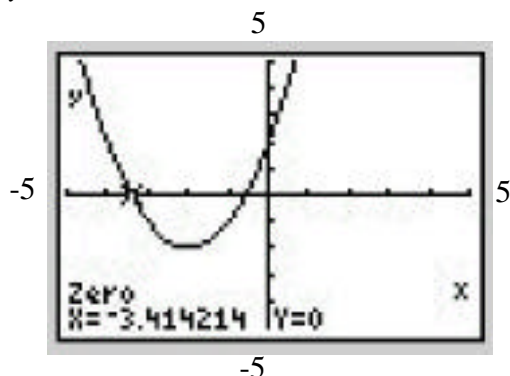


## Graphing Utilities

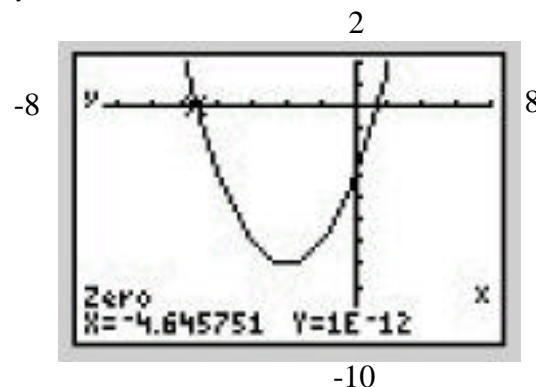
### A.3 Using a Graphing Utility to Locate Intercepts and Check for Symmetry

1.  $y = x^2 + 4x + 2$



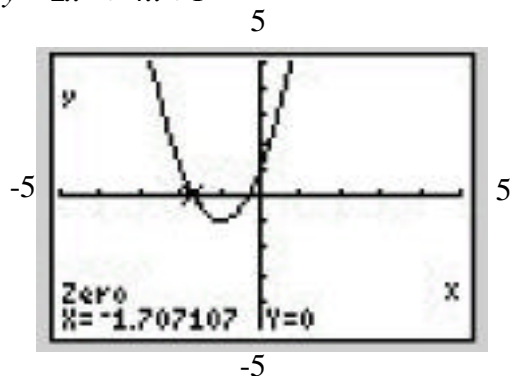
The smaller x-intercept is  $x = -3.41$ .

2.  $y = x^2 + 4x - 3$



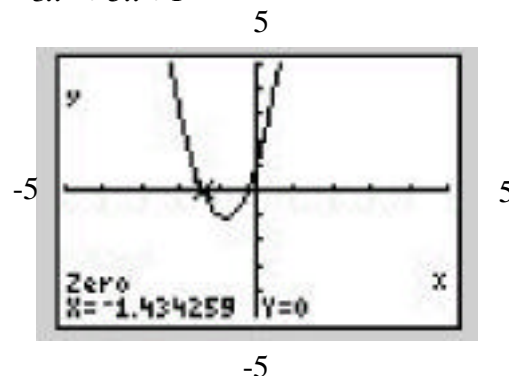
The smaller x-intercept is  $x = -4.65$ .

3.  $y = 2x^2 + 4x + 1$



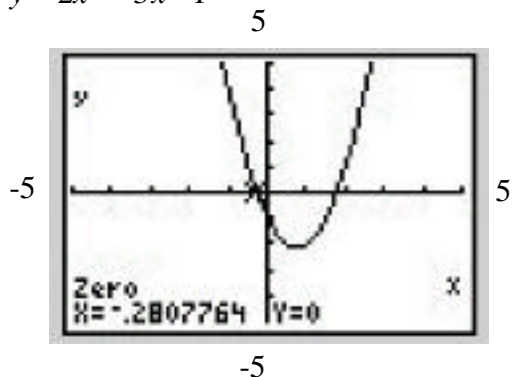
The smaller x-intercept is  $x = -1.71$ .

4.  $y = 3x^2 + 5x + 1$



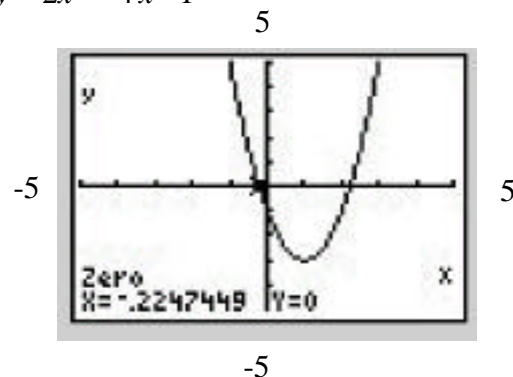
The smaller x-intercept is  $x = -1.43$ .

5.  $y = 2x^2 - 3x - 1$



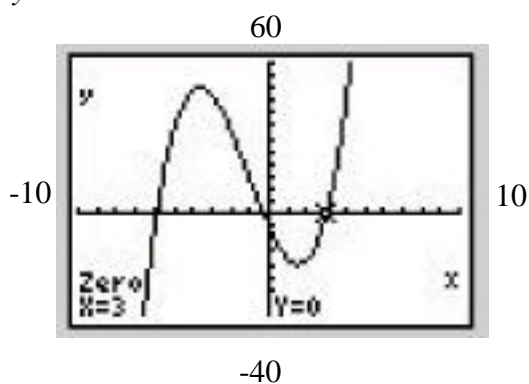
The smaller x-intercept is  $x = -0.28$ .

6.  $y = 2x^2 - 4x - 1$



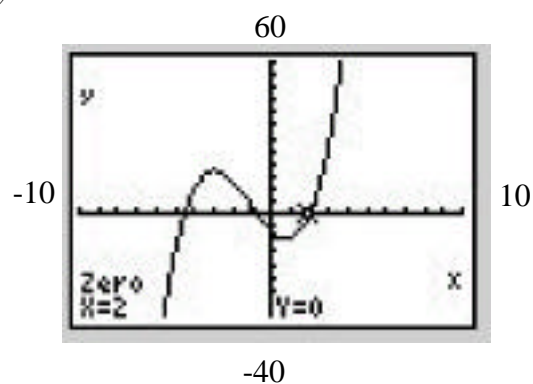
The smaller x-intercept is  $x = -0.22$ .

7.  $y = x^3 + 3.2x^2 - 16.83x - 5.31$



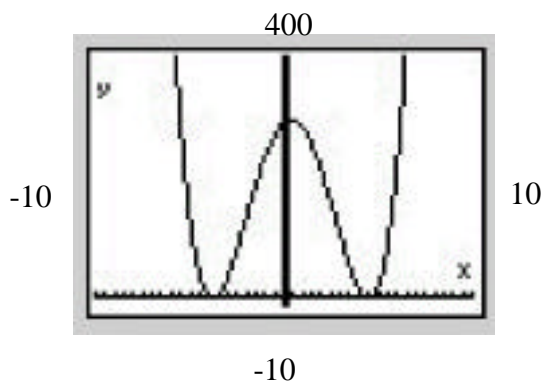
The positive x-intercept is  $x = 3$ .

8.  $y = x^3 + 3.2x^2 - 7.25x - 6.3$

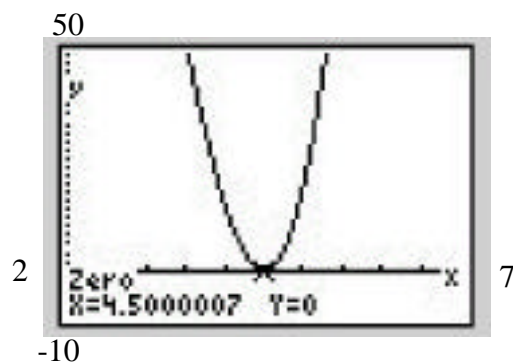


The positive x-intercept is  $x = 2$ .

9.  $y = x^4 - 1.4x^3 - 33.71x^2 + 23.94x + 292.41$

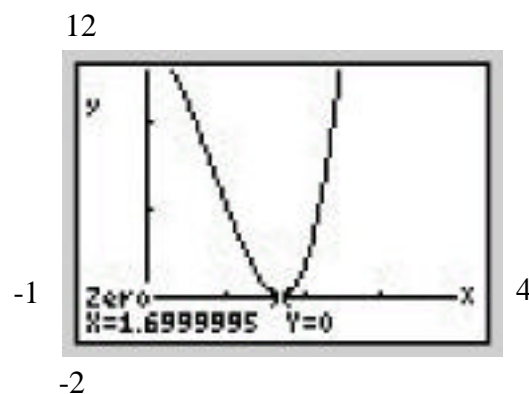
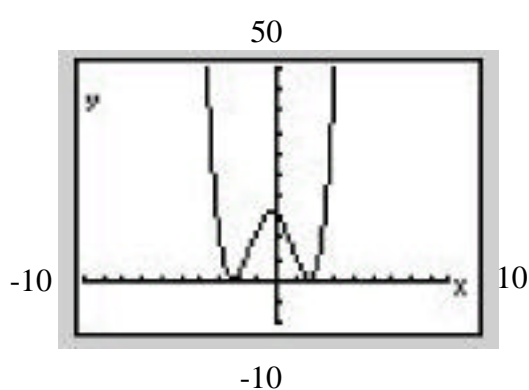


We zoom in on the positive x-intercept:



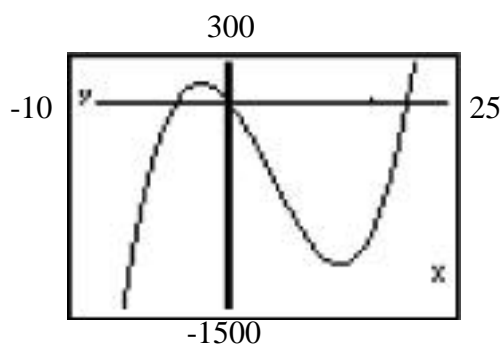
The positive x-intercept is  $x = 4.50$ .

10.  $y = x^4 + 1.2x^3 - 7.46x^2 - 4.692x + 15.2881$  We zoom in on the positive x-intercept:

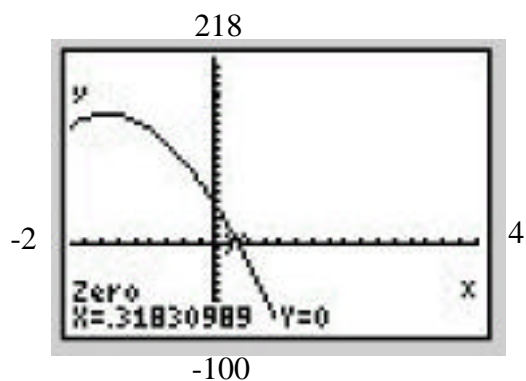


The positive x-intercept is  $x = 1.70$ .

11.  $y = \pi x^3 - (8.88\pi + 1)x^2 - (42.066\pi - 8.88)x + 42.066$

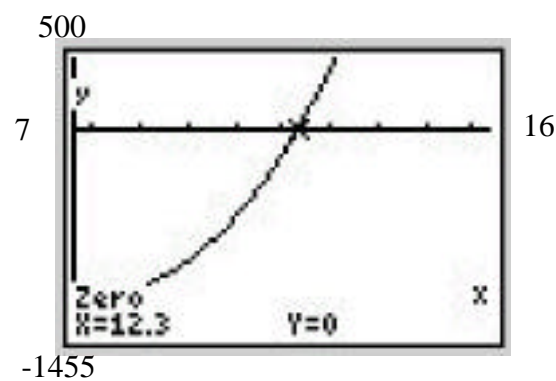


We zoom in on the positive x-intercepts:



The smallest positive x-intercept is  $x = 0.32$ .

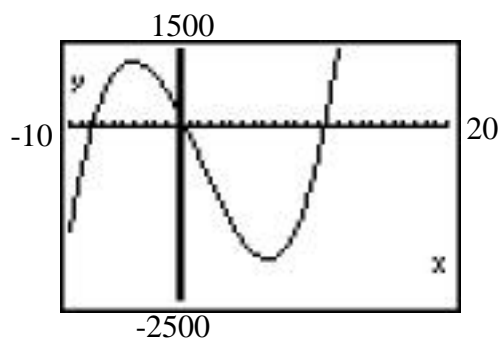
We zoom in on the positive x-intercepts:



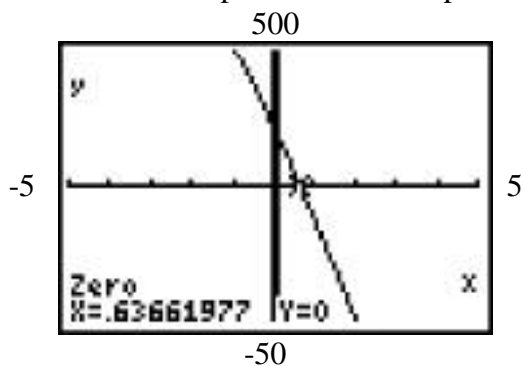
The largest positive x-intercept is  $x = 12.3$ .

Section A.3 Using a Graphing Utility to Locate Intercepts and Check for Symmetry

12.  $y = \pi x^3 - (5.63\pi + 2)x^2 - (108.392\pi - 11.26)x + 216.784$

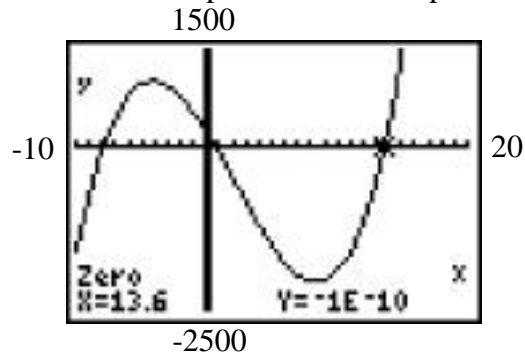


We zoom in on the positive x-intercepts:



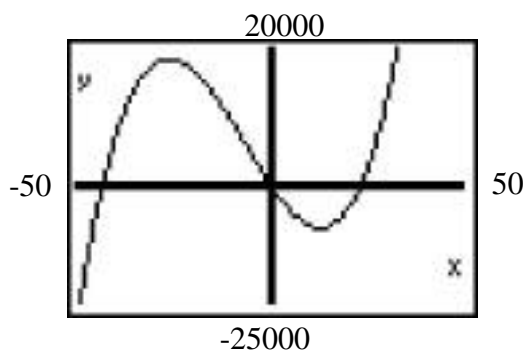
The smallest positive x-intercept is  $x = 0.64$ .

We zoom in on the positive x-intercepts:

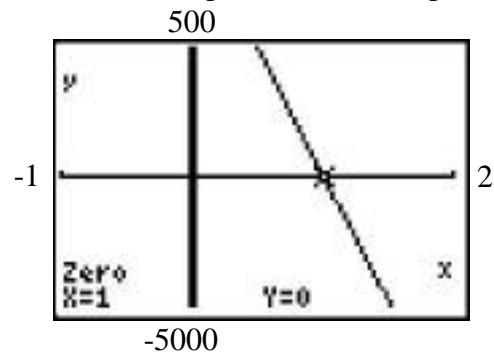


The largest positive x-intercept is  $x = 13.60$ .

13.  $y = x^3 + 19.5x^2 - 1021x + 1000.5$

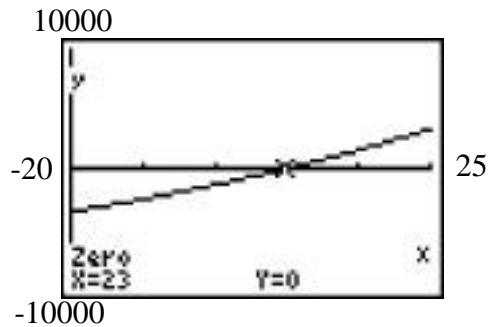


We zoom in on the positive x-intercepts:



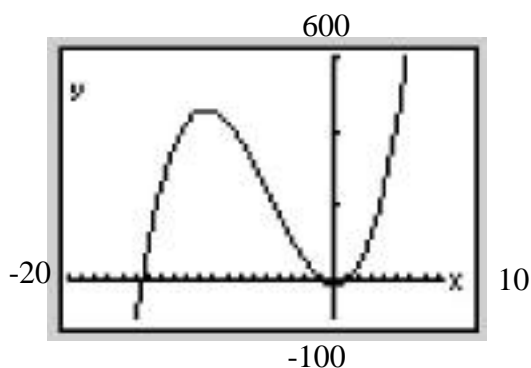
The smallest positive x-intercept is  $x = 1$ .

We zoom in on the positive x-intercepts:

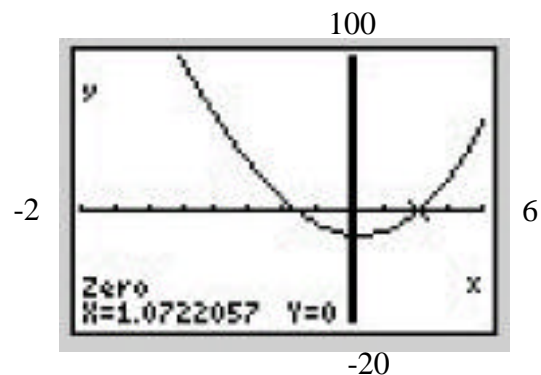


The largest positive x-intercept is  $x = 23$ .

14.  $y = x^3 + 14.2x^2 - 4.8x - 12.4$



We zoom in on the positive x-intercept:



The positive x-intercept is  $x = 1.07$ .

15. x-intercepts:  $(-1.5, 0)$ ;  $(1.5, 0)$

y-intercept:  $(0, -2)$

y-axis symmetry

17. x-intercepts: none

y-intercept: none

origin symmetry

16. x-intercept:  $(0, 0)$

y-intercept:  $(0, 0)$

origin symmetry

18. x-intercept: none

y-intercept: none

x-axis symmetry