

Factoring, 6.1, 6.2, + Graphing Practice

Write each polynomial in standard form. Then classify it by degree and by number of terms.

1. $4x + x + 2$

$5x + 2$

linear binomial

2. $-3 + 3x - 3x$

-3

constant mono

3. $6x^4 - 1$

quart. bi

4. $a^3(a^2 + a + 1)$

$a^5 + a^4 + a^3$

quintic tri

5. $x(x+5) - 5(x+5)$

$x^2 + 5x - 5x - 25$

$x^2 - 25$

quad bi

6. $p(p-5) + 6$

$p^2 - 5p + 6$

quad tri

7. $(3c^2)^2$

$(3c^2)(3c^2)$

$9c^4$

quartic monomial

8. $-(3-b)$

$-3 + b$

linear bi

9. $(x-5)(x+5)(2x-1)$

$(x^2 - 25)(2x - 1)$

$2x^3 - x^2 - 50x + 25$

cubic poly

Write a polynomial function in standard form with the given zeros.

10. $-1, 3, 4$

$(x+1)(x-3)(x-4)$

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

$(x^2 - 2x - 3)(x-4)$

$x^3 - 4x^2 - 2x^2 + 9x - 3x + 12$

$x^3 - 6x^2 + 5x + 12$

11. $1, 1, 2$

$(x-1)(x-1)(x-2)$

$(x^2 - 1x - 1x + 1)(x-2)$

$(x^2 - 2x + 1)(x-2)$

$x^3 - 2x^2 - 2x^2 + 4x + x - 2$

$x^3 - 4x^2 + 5x - 2$

12. $-3, 0, 0, 5$

$x^2(x+3)(x-5)$

$x^2(x^2 + 3x - 5x - 15)$

$x^2(x^2 - 2x - 15)$

$x^4 - 2x^3 - 15x^2$

For each function, determine the zeros. State the multiplicity of any multiple zeros.

13. $y = (x-5)^3$

$x = 5$ m. 3

14. $y = x(x-8)^2$

$x = 0$ m. 1

$x = 8$ m. 2

15. $y = (x-2)(x+7)^3$

$x = 2$ m. 1

$x = -7$ m. 3

Determine the end behavior, zeros, and cross/bounce of each function (Hint: What form will allow you to see the zeros?). Then, sketch its graph.

16. $f(x) = x^4 - 8x^3 + 16x^2$

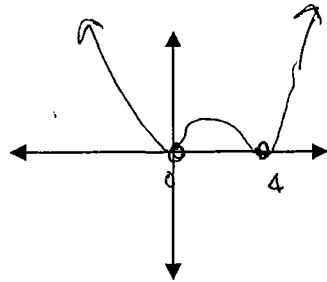
$x^2(x^2 - 8x + 16)$

$x^2(x-4)(x-4)$

$x=0 \quad x=4 \quad x=4$

0 mult 2

4 mult 2

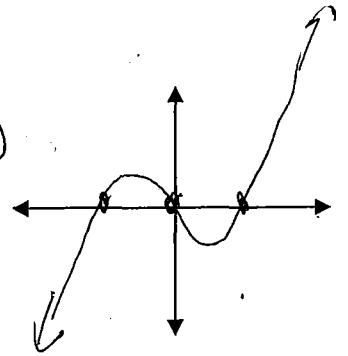


17. $y = 9x^3 - 81x$

$9x(x^2 - 9)$

$9x(x-3)(x+3)$

$x=0 \quad x=3 \quad x=-3$

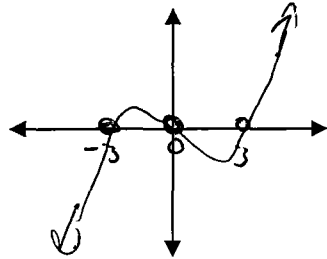


18. $y = 2x^3 - 18x$

$2x(x^2 - 9)$

$2x(x+3)(x-3)$

$x=0 \quad x=-3 \quad x=3$

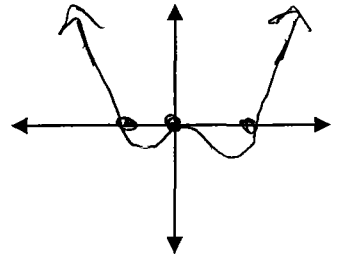


19. $y = x^4 - x^3 - 6x^2$

$x^2(x^2 - x - 6)$

$x^2(x-3)(x+2)$

$x=0$
bore

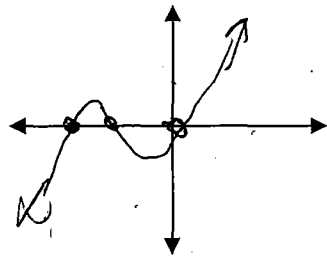


20. $f(x) = x^3 + 7x^2 + 12x$

$x(x^2 + 7x + 12)$

$x(x+4)(x+3)$

$x=0 \quad x=-4 \quad x=-3$

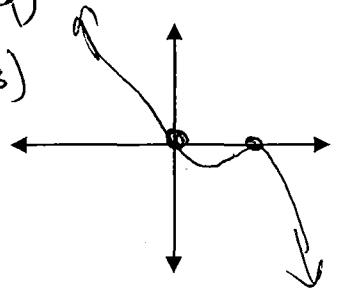


21. $f(x) = -3x^3 + 18x^2 - 27x$

$-3x(x^2 - 6x + 9)$

$-3x(x-3)(x-3)$

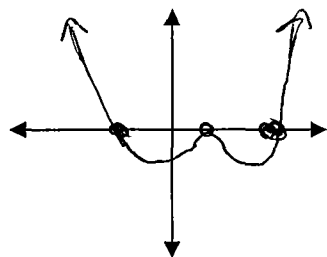
$x=0 \quad x=3 \quad x=3$



22. $y = (x+1)(x-1)^2(x-3)^3$

$-1 \quad 1 \quad 3 \rightarrow 3$
 2

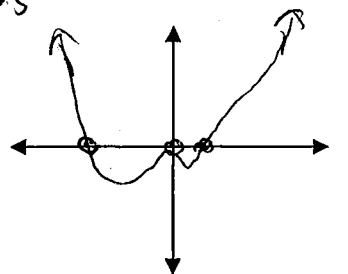
deg = 6



23. $f(x) = x^2(x-2)(x+5)$

$x=0 \quad x=2 \quad x=-5$

deg: 4



~~1. $f(x) = x^3 - 3x^2$~~ ~~$x^2(x-3)$~~

For each of the following, use the end behavior and x-intercepts to match the polynomial to its graph.

1. ~~$f(x) = x^3 - 3x^2$~~ ~~$x^2(x-3)$~~

6. ~~$f(x) = -2x^3 + 8x$~~
 ~~$-2x(x^2 - 4)$~~

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

2. ~~$f(x) = x$~~

7. ~~$f(x) = (x-1)(x-3)(x-5)$~~

12. ~~$f(x) = -x^3 + 9x$~~ ~~$-x(x^2 - 9)$~~

3. ~~$f(x) = -3(x-1)(x-2)^2(x-3)$~~

8. ~~$f(x) = -2x^2 + 16x - 24$~~

13. ~~$f(x) = 3x^4 - 3x^3 - 3x^2 + 3x$~~

4. ~~$f(x) = -4x^2 + 9$~~

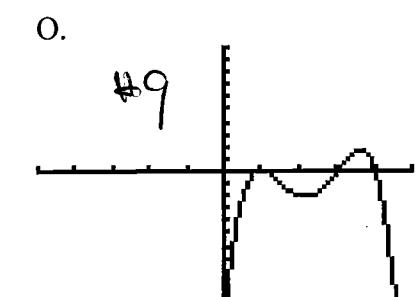
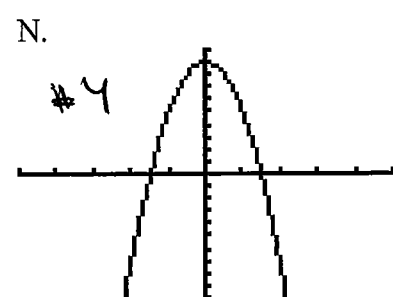
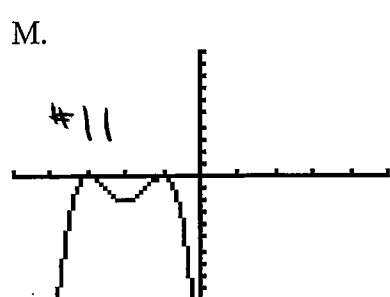
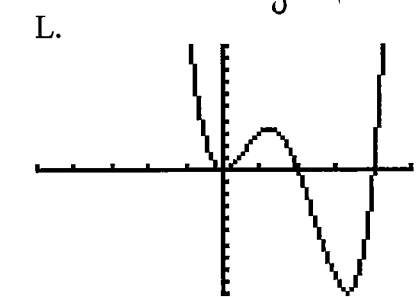
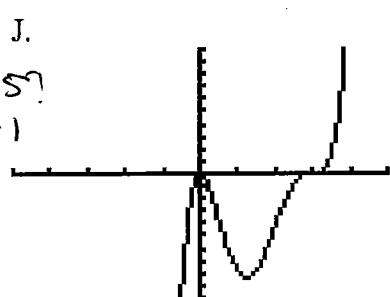
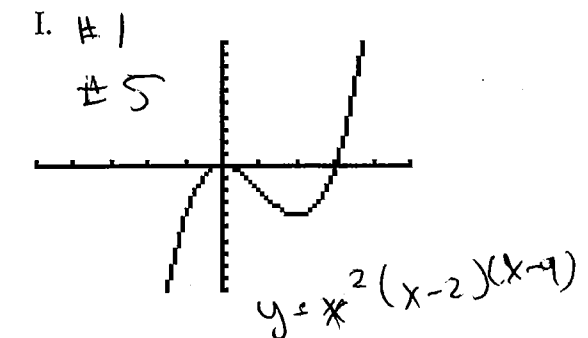
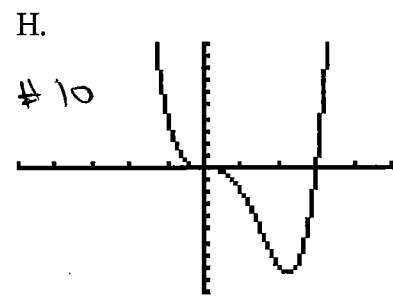
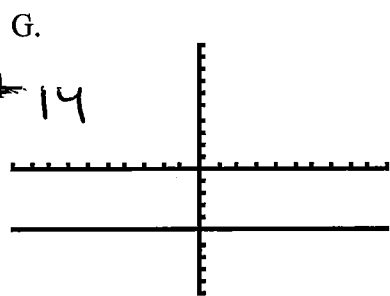
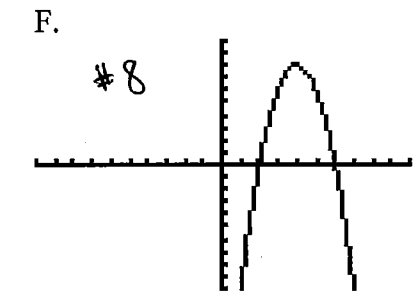
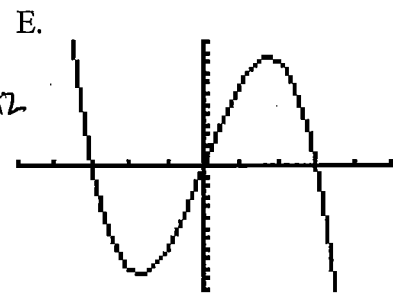
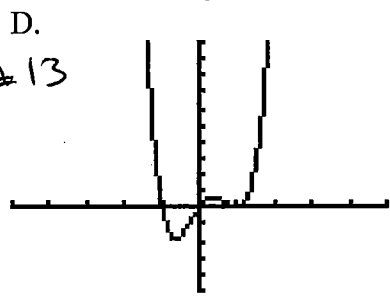
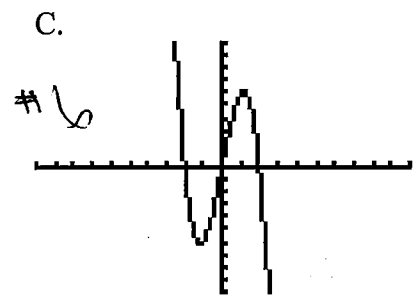
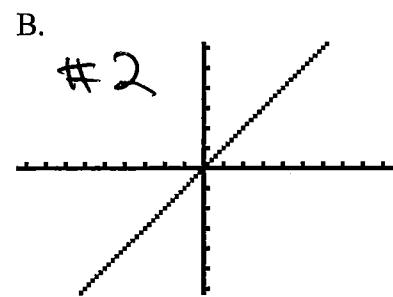
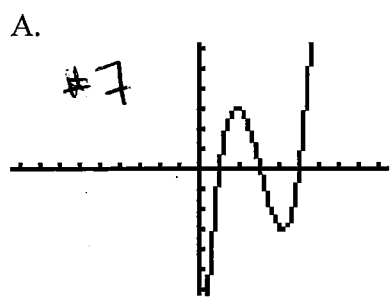
9. ~~$f(x) = -(x-4)(x-3)(x-1)^2$~~

14. ~~$f(x) = 5$~~

5. ~~$f(x) = x^2(x-3)^3$~~

10. ~~$f(x) = x^4 - 3x^3$~~
 ~~$x^3(x-3)$~~

15. Write a quartic polynomial to describe the remaining graph.
 $x(3x^3 - 3x^2 - 3x + 3)$



Pg 324

9-12

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