Algebra 2
140

Match each equation with a graph of a related polynomial

a. $x^2 + 5x + 4 = 0$

b. $x^3 - 2x^2 - x + 2 = 0$

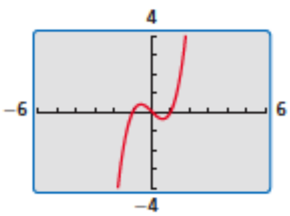
c. $x^3 + x^2 - 2x = 0$

d. $x^3 - x = 0$

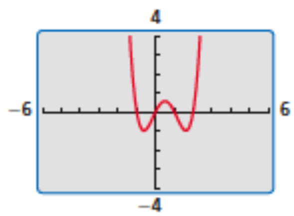
e. $x^4 - 5x^2 + 4 = 0$

f. $x^4 - 2x^3 - x^2 + 2x = 0$

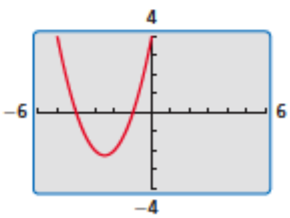
A.



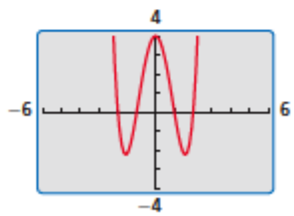
B.



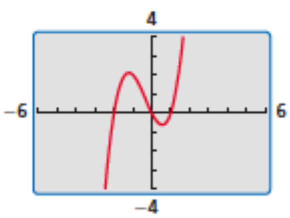
C.



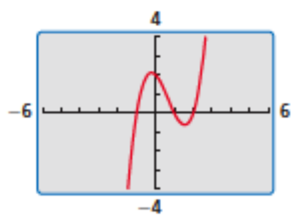
D.



E.



F.



a. $(x + 4)(x + 1)$

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

c. $x(x^2 + x - 2) = x(x + 2)(x - 1)$

d. $x(x^2 - 1) = x(x + 1)(x - 1)$

e. $(x^2 - 4)(x^2 - 1) = (x + 2)(x - 2)(x + 1)(x - 1)$

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

Factoring Tips:

1. When factoring, always check if there is a common factor first.
   $18x^4 - 3x^3 - 36x^2 = 3x^2(6x^2 - x - 12) = 3x^2(3x + 4)(2x - 3)$

2. When given 4 terms, sometimes grouping is helpful in factoring.
   $x^3 - 3x^2 - 5x + 15 = (x^3 - 3x^2) - (5x - 15) = x^2(x - 3) - 5(x - 3) = (x - 3)(x^2 - 5)$

3. When factoring a difference (subtraction) between two squares, the factors are conjugates of each other.
   $16x^2 - 9 = (4x + 3)(4x - 3)$

4. Factoring the sum of two cubes.
   $27x^3 + 8 = (3x + 2)(9x^2 - 6x + 4)$

5. Factor the difference of two cubes.
   $8x^3 - y^3 = (2x - y)(4x^2 + 2xy + y^2)$

1. When a polynomial $P(x)$ is divided synthetically by $x - k$, and the remainder is r, then $P(k) = r$.
2. When a polynomial $P(x)$ is divided synthetically by $x - y$, and the remainder is 0, then $x - k$ is a factor, and the depressed polynomial indicated is also a factor.

Algebra 2 Assignment 140 Monday November 30 2015 Hour Name

Completely Factor the following.

1. $x^3 - 2x^2 - 24x$

2. $4k^5 - 100k^3$

3. $3p^5 - 192p^3$

4. $2m^6 - 24m^5 + 64m^4$

5. $18v^9 + 33v^8 + 14v^7$

6. $x^3 + 64$

7. $y^3 + 512$

8. $g^3 - 343$

9. $c^3 - 27$

10. $3h^9 - 192h^6$

11. $y^3 - 5y^2 + 6y - 30$

12. $3a^3 + 18a^2 + 8a + 48$

13. $2k^3 - 20k^2 + 5k - 50$

14. $x^3 - 8x^2 - 4x + 32$

15. $49k^4 - 9$

16. $16z^4 - 81$