Honors Math II
Unit 5 day 2: factoring

Name Key
Period_____ Date_____

Factor the polynomial completely.

1. $x^3 - 6x^2 - 72x$

$x(x^2 - 6x - 72)$

$x(x-12)(x+6)$

2. $3y^5 - 48y^3$

$3y^3(y^2 - 16)$

$3y^3(y+4)(y-4)$

3. $x^3 + 8$

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

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

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

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

5. $4x^3 + 8x^2 - 9x - 18$

$4x^2(x+2) - 9(x+2)$

$(x+2)(4x^2 - 9)$

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

6. $y^3 - 64$

$(y-4)(y^2 + 4y + 16)$

7. $x^4 - 25$

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

8. $3x^4 - x^2 - 24$

$(3x^2 + 8)(x^2 - 3)$

9. $27x^3 - 1000$

$(3x - 10)(9x^2 + 30x + 100)$

10. $192x^3 - 3$

$3(64x^3 - 1)$

$3(4x-1)(16x^2 + 4x + 1)$

11. $y^3 - 7y^2 + 4y - 28$

$y^2(y-7) + 4(y-7)$

$(y-7)(y^2+4)$

12. $x^3 + 5x^2 - 9x - 45$

$x^2(x+5) - 9(x+5)$

$(x+5)(x^2-9)$

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

13. $3m^3 - m^2 + 9m - 3$

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

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

14. $x^4 + 7x^2 + 6$

$(x^2 + 6)(x^2 + 1)$

15. $27m^3 + 1$

$(3m+1)(9m^2-3m+1)$

16. $25x^3 - 100x^2 - x + 4$

$25x^2(x-4) - 1(x-4)$

$(x-4)(25x^2-1)$

$(x-4)(5x+1)(5x-1)$

17. $16x^3 - 44x^2 - 42x$

$2x(8x^2 - 22x - 21)$

$2x(2x-7)(4x+3)$

18. $n^4 - 4n^2 - 60$

$(n^2-10)(n^2+6)$

19. $-4x^4 - 500x$

$-4x(x^3+125)$

$-4x(x+5)(x^2-5x+25)$

20. $8y^6 - 38y^4 - 10y^2$

$2y^2(4y^4 - 19y^2 - 5)$

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

21. $x^5 - 3x^4 - 16x + 48$

$x^4(x-3) - 16(x-3)$

$(x-3)(x^4-16)$

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

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

22. $8 - x^3$

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

Find the real-number solutions of the equation.

23. $y^3 - 5y^2 = 0$

$y^2(y-5)=0$

$y^2=0 \quad y-5=0$

$y=0 \quad y=5$

24. $18x^3 = 50x$

$18x^3 - 50x = 0$

$2x(9x^2-25)=0$

$2x(3x+5)(3x-5)=0$

$x=0 \quad x=\frac{-5}{3} \quad x=\frac{5}{3}$

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

$x^2(x+3) - 1(x+3) = 0$

$(x+3)(x^2-1)=0$

$(x+3)(x+1)(x-1)=0$

$x = -3, -1, 1$

26. $5x^3 + 15x^2 + 12x = -36$

$5x^3 + 15x^2 + 12x + 36 = 0$

$5x^2(x+3) + 12(x+3) = 0$

$(5x^2+12)(x+3)=0$

$x=-3 \quad x = \pm\sqrt{-12/5}$

imaginary