ACADEMIC Algebra 1 Name KEY

Chapter 9 Review (circle final answer)

Date _____ Period ____

Name each polynomial by degree (1st word) and number of terms (2nd word).

1) $-10x$ (1)

linear monomial

2) $6 - 2x$ (1)

linear binomial

3) $3 + 7x^2$ (2)

quadratic binomial

4) $8x + 5x^3$ (3)

cubic binomial

5) -2

constant monomial

6) $4 - 8x^2 + 9x$ (2)

quadratic trinomial

Simplify each sum.

7) $(3x^2 - x^3 - 1) + (1 - 3x^2 - 2x^3)$

$-3x^3$

8) $(3x^4 - x^2 - 3x^3) + (-4x^4 - x^3 - 6)$

$-x^4 - 4x^3 - x^2 - 6$

Simplify each difference. Step 1 - rewrite as an adition problem.

9) $(-6x^2 - x^3 + 6x) + (8x^3 - 6 + 6x^2)$ (-1)

$-6x^2 - x^3 + 6x - 8x^3 + 6 - 6x^2$

$-9x^3 - 12x^2 + 6x + 6$

10) $(6x^4 - x - x^2) + (-x - 2x^4 + 8x^2)$ (-1)

$6x^4 - x - x^2 + x + 2x^4 - 8x^2$

$8x^4 - 9x^2$

Factor. Remember to mentally multiply to check.

11) $x^2 + 2x - 15$

1 15
3 5

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

12) $x^2 + x - 90$

1 90
2 45
3 30
5 18
6 15
9 10

$(x - 9)(x + 10)$

13) $x^2 - 10x + 25 = (x-5)(x-5)$

$(x - 5)^2$

14) $x^2 - 81 =$

PSQ - PSQ

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

15) $x^2 + 20x + 100 = (x+10)(x+10)$

$(x + 10)^2$

16) $x^2 - 17x + 70$

1 70
2 35
5 14
7 10

$(x - 7)(x - 10)$

Factor each completely. Remember: Step 1 in factoring is to look for a GCF!!!

17) $6x^2 - 24x + 24$ $= 6(x^2 - 4x - 4)$ (1 4, 2 2)

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

18) $-4x^2 - 16x + 128$ $= -4(x^2 + 4x - 32)$ (1 32, 2 16, 4 8)

$-4(x+8)(x-4)$

19) $5x^2 - 80 = 5(x^2 - 16) =$

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

20) $4x^2 - 4x = 4x(x-1)$

21) $9x^2 + 21x - 18 = 3(3x^2 + 7x - 6)$ (1 6, 2 3)

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

22) $-4x^2 + 6x + 4 = -2(2x^2 + 3x + 2) =$

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

Solve each equation by factoring. Remember to use your calculator to check in the original equation!

23) $x^2 - 7x = 0$

$x(x-7) = 0$

$x = 0$ C: $0 = 0$ ✓

$x - 7 = 0$

$x = 7$ C: $0 = 0$ ✓

24) $x^2 - 10x + 25 = 0$

$(x-5)(x-5) = 0$

$x - 5 = 0$

$x = 5$ C: $0 = 0$ ✓

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① PUT INTO $Ax^2 + Bx + C = 0$

25) $5x^2 + 15x - 52 = -2$

$+2 \quad +2$

$5x^2 + 15x - 50 = 0$

② FACTOR GCF

$5(x^2 + 3x - 10) = 0$

③ FACTOR

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

④ SET FACTORS $= 0$ AND SOLVE

$5 = 0$

$x + 5 = 0$

$x = -5$ C: $-2 = -2$ ✓

$x - 2 = 0$

$x = 2$ C: $-2 = -2$ ✓

⑤ Check all solutions in orig. eq. use calc!

26) $4x^2 - 105 = -5$

$+5 \quad +5$

$4x^2 - 100 = 0$

$4(x^2 - 25) = 0$

$4(x-5)(x+5) = 0$

$4 = 0$

$x - 5 = 0$

$x = 5$ C: $-5 = -5$ ✓

$x + 5 = 0$

$x = -5$ C: $-5 = -5$ ✓

27) $x^2 - 9x + 20 = 0$

$(x-4)(x-5)=0$

$x-4=0$ $\quad$ $x-5=0$

$x=4$ $\quad$ $x=5$

C: $0=0$✓ $\quad$ C: $0=0$✓

28) $4x^2 - 28x + 40 = 0$

$4(x^2-7x+10)=0$

$4(x-2)(x-5)=0$

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

$x=2$ $\quad$ $x=5$

C: $0=0$✓ $\quad$ C: $0=0$✓

29) $5x^3 - 35x^2 + 80x = 20x$

$-20x \quad -20x$

$5x^3 - 35x^2 + 60x = 0$

$5x(x^2-7x+12)=0$

$5x(x-3)(x-4)=0$

$5x=0$ $\quad$ $x-3=0$ $\quad$ $x-4=0$

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

C: $0=0$✓ $\quad$ C: $60=60$✓ $\quad$ C: $80=80$✓

Solve each equation by factoring. Check in the original equation!

30) $2x^2 + 6 = -7x$

$+7x \quad +7x$

$2x^2 + 7x + 6 = 0$ $\quad$ 16, 23

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

$2x+3=0$ $\quad$ $x+2=0$

$x=-3/2$ $\quad$ $x=-2$

C: $10.5=10.5$✓ $\quad$ C: $14=14$✓

31) $5x^2 - 3 = -2x$

$+2x \quad +2x$

$5x^2 + 2x - 3 = 0$

$(5x-3)(x+1)=0$

$5x-3=0$ $\quad$ $x+1=0$

$x=3/5$ $\quad$ $x=-1$

C: $-1.2=-1.2$✓ $\quad$ C: $2=2$✓

32) $5x^3 + 15x^2 - 45x = 5x$

$-5x \quad -5x$

$5x^3 + 15x^2 - 50x = 0$

$5x(x^2+3x-10)=0$

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

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

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

C: $0=0$✓ $\quad$ C: $-25=-25$✓ $\quad$ C: $10=10$✓

Find each product. Remember to write answers in standard form (high to low exponents with the constant last.)

33) $2x^3(7x^2 - 6x - 1)$

$14x^5 - 12x^4 - 2x^3$

34) $-8x(6x^2 - 4x - 6)$

$-48x^3 + 32x^2 + 48x$

35) $(4x - 8)(8x^2 + 6x + 3)$

$32x^3 + 24x^2 + 12x +$
$-64x^2 - 48x - 24 =$

$32x^3 - 40x^2 - 36x - 24$

36) $(4x - 8)(2x^2 + 4x - 7)$

$8x^3 + 16x^2 - 28x +$
$-16x^2 - 32x + 56$

$8x^3 - 60x + 56$

37) $(3x + 2)(3x - 3)$

$9x^2 - 9x + 6x - 6 =$

$9x^2 - 3x - 6$

38) $(2x - 4)(4x + 3)$

$8x^2 + 6x - 16x - 12 =$

$8x^2 - 10x - 12$

39) $(5x + 7)(5x - 7)$

$25x^2 - 35x + 35x - 49 =$

$25x^2 - 49$

40) $(7x + 4)(7x - 4)$

$49x^2 - 28x + 28x - 16 =$

$49x^2 - 16$

41) $(3x + 8)^2$ expand

$(3x+8)(3x+8)$

$9x^2 + 24x + 24x + 64 =$

$9x^2 + 48x + 64$

42) $(3x - 5)^2$ expand

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

$9x^2 - 15x - 15x + 25 =$

$9x^2 - 30x + 25$