N: D: P: 1 2 3 4 5 6

Algebra 2 // **Topic 8 Test Review A** *Mission Hills Math 2013*

Directions: Calculators are not allowed. Simplify your answers as much as possible.
Show your work on a separate sheet of paper and attach.

1) Subtract: $(5x^2-3x+4)-3(2x^2+4x-1)$

$5x^2-3x+4-6x^2-12x+3$

$\boxed{-x^2-15x+7}$

2) Subtract: $(-4x^2+7x-3)-4(3x^2-3x-2)$

$-4x^2+7x-3-12x^2+12x+8$

$\boxed{-16x^2+19x+5}$

3) Multiply: $-2x^4(5x^2+3x-4)$

$-10x^6-6x^5+8x^4$

4) Multiply: $-3x^2(4x^2-7x-1)$

$-12x^4+21x^3+3x^2$

5) Multiply: $(x-3)(-3x^2+4x-2)$

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

$9x^2-12x+6$

$-3x^3+13x^2-14x+6$

6) Multiply: $(x+4)(-x^2-5x+3)$

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

$-4x^2-20x+12$

$-x^3-9x^2-17x+12$

7) Multiply: $(x+8)(x-8)$

$x^2-8x+8x-64$

x^2-64

8) Multiply: $(x+5)(x-5)$

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

x^2-25

9) Multiply: $(3x^2+4)(3x-4)$

$9x^3-12x^2+12x-16$

10) Multiply: $(4x^2+1)(4x-1)$

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

11) Factor completely: $2x^2-5x-12$

2 3

1 -4

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

12) Factor completely: $5x^2-13x-6$

5 2

1 -3

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

13) Factor completely: x^3+8

x^3+2^3

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

14) Factor completely: x^3+64

x^3+4^3

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

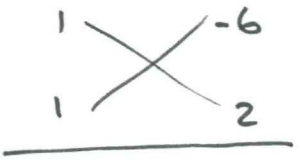
15) Factor completely: $4x^2+12x-40$

$4(x^2+3x-10)$

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

16) Factor completely: $3x^2-12x-36$

$3(x^2-4x-12)$



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

17) The total area of a rectangle is $25x^2-4y^6$. Which factors could represent the length times width?

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

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

18) The total area of a rectangle is $49x^2-9y^4$. Which factors could represent the length times width?

$(7x)^2-(3y^2)^2$

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

19) Factor completely: $(x-5)^2-9y^2$

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

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

20) Factor completely: $(x+3)^2-4y^2$

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

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

29) Find the coefficient of the 4th term in the expansion of $(x+2)^6$.

7 terms

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1

$1x^6 + 6x^5 + 15x^4 + 20x^3 2^3 + 15 2^4 + 6 2^5 + 1 2^6$

4th

$20 \cdot 2^3 = 20 \cdot 8 = \boxed{160}$

30) Find the coefficient of the 2nd term in the expansion of $(2x-1)^4$.

$(2x)^4 - 4(2x)^3 1^1 + 6(2x)^2 1^2 - 4(2x)^1 1^3 + 1 \; 1^4$

$-4 \cdot 2^3 = -4 \cdot 8 = \boxed{-32}$

31) How many terms does the binomial expansion of $(x^3 - 2y^2)^{56}$ have? → 57 terms

32) How many terms does the binomial expansion of $(x^4 + 6y)^{15}$ have? → 16 terms

33) Find all of the real solutions: $x^2 - 3x = 10$ "Solving"

$-10 \quad -10$

$x^2 - 3x - 10 = 0$

1, −5, 1, 2

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

$x-5=0$ $+5 \quad +5$ → $x = 5$

$x+2=0$ $-2 \quad -2$ → $x = -2$

34) Find all of the real solutions: $x^2 - 5x = -4$

$+4 \quad +4$

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

1, −4, 1, −1

$(x-4)(x-1) = 0$

$x-4=0$ $+4 \quad +4$ → $x = 4$

$x-1=0$ $+1 \quad +1$ → $x = 1$

35) Find all of the real solutions: $x^3+4x^2-9x-36=0$

$x^2(x+4)-9(x+4)=0$

$(x+4)(x^2-9)=0$

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

$x^2-9=0$ $\quad +9\ +9$ $\quad \sqrt{x^2}=\sqrt{9}$ $\quad x=\pm 3$

36) Find all of the real solutions: $x^3+3x^2-x-3=0$

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

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

$x^2-1=0$ $\quad +1\ +1$ $\quad \sqrt{x^2}=\sqrt{1}$ $\quad x=\pm 1$

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

37) Express as a polynomial in standard form: $(4x+1)^3$

$= (4x+1)(4x+1)(4x+1)$ (FOIL) — OLD SCHOOL

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

$(16x^2+8x+1)(4x+1)$

$64x^3+32x^2+4x$

$16x^2+8x+1$

$64x^3+48x^2+12x+1$

$\frac{1(4x)^3}{\downarrow} + \frac{3(4x)^2\cdot 1}{3\cdot 16} + \frac{3(4x)\cdot 1^2}{3\cdot 4} + \frac{1\cdot 1^3}{}$

$64x^3 + 48x^2 + 12x + 1$

NEW SCHOOL

45) Factor completely: $2x^4 - 162$

$2x^4 - 162$

$2(x^4 - 81)$

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

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

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

46) Factor completely: $3x^4 - 3$

$3(x^4 - 1)$

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

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

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

47) Factor completely: $5x^3 - 15x^2 + 2x - 6$

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

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

48) Factor completely: $3x^3 + 6x^2 - 2x - 4$

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

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

49) Factor completely: $x^3 - 27y^3$

50) Factor completely: $64x^3 - y^3$