Honors Common Core Math III Name_____

UNIT 4 REVIEW - Operations with Polynomials Date_____ Period____

I. Multiple Choice. Simplify each expression.

1) $(13p^2 - 1 - 10p^4) - (6p^2 - 4p^3 - 14)$

A) $p^4 + 4p^3 + 7p^2 + 26$

B) $-10p^4 + 4p^3 + 7p^2 + 27$

C) $-10p^4 + 4p^3 + 7p^2 + 13$

D) $-10p^4 + 4p^3 + 7p^2 + 26$

$7p^2$ 13 $-10p^4$ $+4p^3$

2) $(-8n^2 - 5 - 13n^3) + (-8n^3 - 2n^2 - 2)$

A) $-21n^3 - 10n^2 - 7$

B) $-21n^3 - 18n^2 + 3$

C) $-21n^3 - 10n^2 + 6$

D) $-21n^3 - 10n^2 + 3$

$-21n^3$ $-10n^2$ -7

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

A) $5x^2 + 19x + 12$

B) $14x^2 - 40$

C) $21x^2 + 40x - 21$

D) $14x^2 + 19x - 40$

$21x^2 + 49x - 9x - 21$

$21x^2 + 40x - 21$

4) $7\sqrt{45x^4y^3z^2}$

A) $30z^2x\sqrt{3xy}$

B) $21x^2yz\sqrt{5y}$

C) $27y^2x\sqrt{3xyz}$

D) $-70x^2\sqrt{10xyz}$

$\sqrt{9x^4y^2z^2 \cdot 5y}$ $21x^2yz\sqrt{5y}$

5) $\frac{2\sqrt{3}}{4\sqrt{25}}$ $\frac{\sqrt{3}}{10}$

A) $\frac{\sqrt{3}}{10}$

B) $\frac{10\sqrt{3}}{3}$

C) 2

D) $\frac{\sqrt{6}}{20}$

6) $-2\sqrt{72} - 2\sqrt{2} + 4\sqrt{8} - 3\sqrt{8}$

$36 \cdot 2$ $4 \cdot 2$ $4 \cdot 2$

A) $-12\sqrt{2}$

B) $-4\sqrt{2}$

C) $-18\sqrt{2}$

D) $-10\sqrt{2}$

$-12\sqrt{2} - 2\sqrt{2} + 8\sqrt{2} - 6\sqrt{2}$

$-14\sqrt{2} + 2\sqrt{2}$

-5

7) $\frac{4\sqrt{2}}{2 - \sqrt{3}} \cdot \frac{2 + \sqrt{3}}{2 + \sqrt{3}} = \frac{8\sqrt{2} + 4\sqrt{6}}{4 - 3} = \frac{}{1}$

A) $\frac{2 + \sqrt{3}}{3}$

B) $\frac{-2\sqrt{3} - 8}{13}$

C) $\frac{5 + \sqrt{5}}{10}$

D) $8\sqrt{2} + 4\sqrt{6}$

8) $\frac{-8 - 5i}{-7 + i} \cdot \frac{(-7 - i)}{(-7 - i)} = \frac{56 + 8i + 35i + 5i^2}{49 - i^2} = \frac{51 + 43i}{49 + 1}$

A) $\frac{39 + 31i}{17}$

B) $\frac{91 + 13i}{50}$

C) $\frac{49 + 7i}{50}$

D) $\frac{51 + 43i}{50}$

$= \frac{51 + 43i}{50}$

II. Factor each expression completely.

9) $48mn + 30m + 64n + 40$

$6m(8n + 5) + 8(8n + 5)$

$(6m + 8)(8n + 5)$

$2(3m + 4)(8n + 5)$

10) $125 + 216u^3$ Sum of cubes

5 $6u$

$(5 + 6u)(25 - 30u + 36u^2)$

11) $u^4 + u^2 = u^2(u^2+1)$

12) $a^4 + 7a^2 + 10 = (a^2+5)(a^2+2)$

13) $6u^8 + 60u^4 + 96$

$6(u^8+10u^4+16)$

$6(u^4+8)(u^4+2)$

14) $4n^2 - 1 = (2n+1)(2n-1)$

15) $3x^4 + 7x^3 - 40x^2$

$x^2(3x^2+7x-40)$

$x^2(3x-8)(x+5)$

III. Simplify.

16) $-4\sqrt{147x^2y^2z^5}$

$\sqrt{49x^2y^2z^4}\sqrt{3z}$

$-28xyz^2\sqrt{3z}$

17) $\frac{\sqrt{2}-4}{5-\sqrt{2}} \cdot \frac{5+\sqrt{2}}{5+\sqrt{2}} = \frac{5\sqrt{2}+2-4\sqrt{2}-20}{25-2} = \frac{\sqrt{2}-18}{23}$

18) $(\sqrt{3}+\sqrt{5})(\sqrt{3}+\sqrt{2})$

$3+\sqrt{6}+\sqrt{15}+\sqrt{10}$

19) $(-5+\sqrt{2})(-1+\sqrt{2})$

$5-5\sqrt{2}-\sqrt{2}+2 = 7-6\sqrt{2}$

20) $(-7+2i)^2(-7+2i)$

$49-28i-4 = 45-28i$

21) $i^{-6} = \frac{1}{i^6} = \frac{1}{-1} = -1$

$i^2 = -1$

IV. Quadratics

$D = b^2-4ac$ $\quad x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Find the discriminant of each quadratic equation then state the number and type of solutions.

22) $2m^2 - 4m + 2 = 0$ $\quad D = 16-4(2)(2) = 0$

1 real solution

23) $8v^2 - 6v - 3 = -8$ $\quad +8 \quad +8$

$8v^2 - 6v + 5 = 0$

$D = 36-4(8)(5)$

$D = 36-160 = -124$

2 imaginary solutions

Solve each equation with the quadratic formula.

24) $2v^2 + 3v - 9 = 0$ $\quad a=2,\ b=3,\ c=-9$

$v = \frac{-3 \pm \sqrt{9-4(2)(-9)}}{4}$

$v = \frac{-3 \pm \sqrt{9+72}}{4}$

$v = \frac{-3 \pm \sqrt{81}}{4}$

$v = \frac{-3 \pm 9}{4}$

$\frac{-3+9}{4}$ $\quad \frac{-3-9}{4}$

$\frac{6}{4}$ $\quad -\frac{12}{4}$

$\{3/2, -3\}$

25) $7m^2 = -8m - 5$

$7m^2 + 8m + 5 = 0$

$m = \frac{-8 \pm \sqrt{64-4(7)(5)}}{14}$

$= \frac{-8 \pm \sqrt{-76}}{14}$

$= \frac{-8 \pm 2i\sqrt{19}}{14} = \frac{-4 \pm i\sqrt{19}}{7}$