

Algebra P4

Spring Final Review 1 of 3

Directions: Do not use a calculator. All answers must be simplified and exact.

Key

Completely factor each polynomial.

1) $2x^2 + 5x + 2$

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

2) $9c^3d^2 - 6cd^3$

$3cd^2(3c^2 - 2d)$

3) $16n^2 - 25$

$(4n+5)(4n-5)$

4) $6g^4 - 14g^3 + 4g^2$

$2g^2(3g^2 - 7g + 2)$

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

5) $144a^2 - b^2$

$(12a+b)(12a-b)$

6) $m^2 + 10m + 25$

$(m+5)^2$

Simplify each expression: Your answers should contain no negative exponents and all radicals must have a rational denominator. No solving...these are not equations!!

7) $\frac{c^{-5}c^4}{c^3c^{-7}} = \frac{c^4c^7}{c^3c^5}$
 $= \frac{c^{11}}{c^8} = \boxed{c^3}$

8) $\sqrt{72d^6g^{100}k^8}$
 $6d^3g^{50}k^4\sqrt{2}$

9) $(7z^2 + 4 - z) - (-5 + 3z^2)$

$4z^2 + 9 - z$

10) $\frac{x^2 + 2x}{16} \cdot \frac{24}{x^2 - 4}$

$= \frac{x(x+2)}{2 \cdot 16} \cdot \frac{24 \cdot 3}{(x+2)(x-2)}$

$= \boxed{\frac{3x}{2(x-2)}}$

11) $(2b^{-4})^2$

$= \frac{4}{b^8}$

12) $\frac{6}{w^2 - 3w} \div \frac{6w + 12}{2w^2 - 2w - 12}$

$\frac{6}{w(w-3)} \cdot \frac{2(w-3)(w+2)}{6(w+2)}$

$= \boxed{\frac{2}{w}}$

13) $(3 - \sqrt{3})(2 - \sqrt{2})$

$6 - 2\sqrt{3} - 3\sqrt{2} + \sqrt{6}$

14) $\frac{2}{x+5} + \frac{3x}{x^2 + 4x - 5}$

$\frac{2(x-1)}{(x-1)(x+5)} + \frac{3x}{(x+5)(x-1)}$

$= \boxed{\frac{5x-2}{(x-1)(x+5)}}$

15) $\sqrt{18} + \sqrt{50} + \sqrt{32}$

$3\sqrt{2} + 5\sqrt{2} + 4\sqrt{2}$

$= \boxed{12\sqrt{2}}$

$$16) \frac{m^2-1}{2m^2-m-1} \cdot \frac{2m+1}{m^2-2m+1}$$

$$\frac{(m+1)(m-1)}{(2m+1)(m-1)} \cdot \frac{2m+1}{(m-1)(m-1)}$$

$$= \frac{m+1}{(m-1)^2}$$

$$17) \sqrt{12} + \sqrt{75}$$

$$2\sqrt{3} + 5\sqrt{3}$$

$$= \boxed{7\sqrt{3}}$$

$$18) (5m-3n)(4m-2n)$$

$$20m^2 - 12nm - 10mn + 6n^2$$

$$= \boxed{20m^2 - 22mn + 6n^2}$$

$$19) \sqrt{24x^{12}y}$$

$$2x^6\sqrt{6y}$$

$$20) \frac{x^2-7}{x-4} - \frac{3x-3}{x-4}$$

$$= \frac{x^2-3x-4}{x-4}$$

$$= \frac{(x-4)(x+1)}{x-4} = \boxed{x+1}$$

$$21) 2\sqrt{7}(\sqrt{7}+3\sqrt{5})$$

$$= 2 \cdot 7 + 6\sqrt{35}$$

$$= \boxed{14 + 6\sqrt{35}}$$

$$22) \left(\frac{2a^2}{b}\right)^{-3}$$

$$= \frac{b^3}{8a^6}$$

$$23) -3jk^2(3jk+2k^3)$$

$$-9j^2k^3 - 6jk^5$$

$$24) (2\sqrt{6}-\sqrt{2})(3\sqrt{8}-3\sqrt{2})$$

$$6\sqrt{48} - 3\sqrt{16} - 6\sqrt{12} + 3\sqrt{4}$$

$$24\sqrt{3} - 12 - 12\sqrt{3} + 6$$

$$= \boxed{-6 + 12\sqrt{3}}$$

$$25) -(p-4r)-(5-r)+3(r-5)$$

$$-p+4r-5+r+3r-15$$

$$\boxed{8r-p-20}$$

$$26) \sqrt{25}-\sqrt{135}+\sqrt{60}-\sqrt{16}$$

$$5+3\sqrt{15}+2\sqrt{15}-2$$

$$= \boxed{3+5\sqrt{15}}$$

$$27) \frac{12x^2y^3}{3x^2y} \cdot \frac{3xy}{4y} = \frac{3y}{x^2}$$

$$28) (8x-2)(3x^2+2x-1)$$

$$24x^3+16x^2-8x-6x^2-4x+2$$

$$= \boxed{24x^3+10x^2-12x+2}$$

$$29) (6\sqrt{2})^2$$

$$36 \cdot 2 = \boxed{72}$$

$$30) (5-\sqrt{5})^2 = (5-\sqrt{5})(5-\sqrt{5})$$

$$= 25 - 5\sqrt{5} - 5\sqrt{5} + 5$$

$$= \boxed{30-10\sqrt{5}}$$

$$31) \frac{x+2}{x+1} + \frac{x}{x^2-1}$$

$$\frac{(x+2)(x-1)}{(x+1)(x-1)} + \frac{x}{(x+1)(x-1)}$$

$$= \frac{x^2+2x-2}{x^2-1}$$

$$32) \frac{-5b^{-5}}{2b^4c} = \frac{-5}{2b^9c}$$

$$33) (3p-2)^2 = (3p-2)(3p-2)$$

$$9p^2 - 6p - 6p + 4$$

$$\boxed{9p^2 - 12p + 4}$$