

Review P.2-P.5

Simplify. LEVEL 1

1)  $\frac{(64n^4)^{\frac{1}{2}}}{8n^2}$

$64^{\frac{1}{2}} n^2$   
 $8n^2$  *hint*  
 $2^6 = 64$

3)  $\frac{\sqrt[6]{512x^2y^6}}{2y\sqrt[6]{8x^2}}$

$\sqrt[6]{64} \sqrt[6]{8x^2y^6}$   
 $2|y| \sqrt[6]{8x^2}$

2)  $\frac{(27n^6)^{\frac{4}{3}}}{81n^8}$

*mult*  
 $27^{\frac{4}{3}} n^8$   
 $(27^{\frac{1}{3}})^4 n^8$   
 $3^4 n^8 = 81n^8$

4)  $\frac{\sqrt[5]{-128a^3b^7}}{-2b\sqrt[5]{4a^3b^2}}$

$\sqrt[5]{-32} \sqrt[5]{4a^3b^2}$  *hint*  
 $2^5 = 32$   
 $-2b\sqrt[5]{4a^3b^2}$

Simplify. Use absolute value signs when necessary. LEVEL 2

5)  $\frac{4\sqrt[4]{160m^2n}}{8\sqrt[4]{10m^2n}}$

$\sqrt[4]{16} \sqrt[4]{10m^2n}$   
 $2 \cdot 4 \sqrt[4]{10m^2n}$   
 $8\sqrt[4]{10m^2n}$

6)  $\frac{4\sqrt[5]{-288x^6y^5}}{-8xy\sqrt[5]{9x}}$

$4\sqrt[5]{-32} \sqrt[5]{9x^6y^5}$   
 $4 \cdot -2 \sqrt[5]{9x^6y^5}$   
 $-8xy\sqrt[5]{9x}$

Simplify. LEVEL 3

7)  $\frac{\sqrt{12}}{3\sqrt{27}} \cdot \frac{2}{9}$

$\frac{\sqrt{4}\sqrt{3}}{3 \cdot \sqrt{9}\sqrt{3}}$  *← equals 1*

$\frac{2}{3 \cdot 3} = \frac{2}{9}$   
 9)  $\frac{(10 - \sqrt{6})(10 + \sqrt{6})}{90 + 9\sqrt{6}}$

*Conjugate*  
 $\Rightarrow \frac{90 + 9\sqrt{6}}{100 + 10\sqrt{6} - 10\sqrt{6} - \sqrt{36}}$   
*equals zero*  
 $\frac{90 + 9\sqrt{6}}{96}$

Simplify each expression. LEVEL 4

10)  $-2(2k - 10) + 8(4 - 5k)$   
 $-44k + 52$

$-4k + 20 + 32 - 40k$   
 $-44k + 52$

11)  $8(4n - 2) - 5(-10n - 7)$   
 $82n + 19$

$32n - 16 + 50n + 35$   
 $82n + 19$

Find each product. LEVEL 5

12)  $(5r^2 - 6r - 1)(7r + 4)$   
 $35r^3 - 22r^2 - 31r - 4$  \*

13)  $(8k^2 - 2k - 7)(5k - 5)$   
 $40k^3 - 40k^2 - 10k^2 + 10k - 35k + 35$  \*

14)  $(4n - 8)^2$   
 $16n^2 - 64n + 64$

15)  $(7k + 1)(7k - 1)$  *Conjugates*  
 $49k^2 + 7k - 7k - 1$   
*two factors of 504 that add up to 71*  
*equals zero*

Factor each completely. LEVEL 6

16)  $\frac{21x^2 - 30x}{3x(7x - 10)}$   
 $3x(7x - 10)$  \* *GCF*

17)  $7n^2 + 71n + 72$   
 $(7n + 8)(n + 9)$  \* *30*  
 $7n^2 + 63n + 8n + 72$   
 $7n(n + 9) + 8(n + 9)$

18)  $2r^2 - 9r + 7$   
 $(2r - 7)(r - 1)$   
 $2r^2 - 2r - 7r + 7$   
 $2r(r - 1) - 7(r - 1)$   
 $(2r - 7)(r - 1)$  \*

19)  $2b^3 - 13b^2 + 15b$   
 $b(2b^2 - 13b + 15)$   
 $b(2b^2 - 10b - 3b + 15)$   
 $2b(b - 5) - 3(b - 5)$   
 $b(b - 5)(2b - 3)$  \*

20)  $40x^3 - 32x^2 + 5x - 4$   
 $(8x^2 + 1)(5x - 4)$

21)  $35r^3 - 30r^2 + 21r - 18$   
 $(5r^2 + 3)(7r - 6)$  \*  
 $5r^2(7r - 6) + 3(7r - 6)$   
 $(5r^2 + 3)(7r - 6)$

$8x^2(5x - 4) + 1(5x - 4)$   
 $(8x^2 + 1)(5x - 4)$

22)  $16v^2 - 1$  *Conjugates*  
 $(4v + 1)(4v - 1)$   
*difference 2 squares*

23)  $9v^2 + 30v + 25$   
 $(3v + 5)^2$   
 $9v^2 + 15v + 15v + 25$   
 $3v(3v + 5) + 5(3v + 5)$   
 $(3v + 5)(3v + 5)$  \*

Factor each. LEVEL 8

24)  $f(x) = x^4 + 6x^2 + 5$   
 $f(x) = (x^2 + 5)(x^2 + 1)$  *Call  $x^2 = m$*

25)  $f(x) = x^4 + 10x^2 + 9$   
 $f(x) = (x^2 + 9)(x^2 + 1)$  *Call  $x^2 = m$*

$(x^2)^2 + 6x^2 + 5$   
 $(m)^2 + 6m + 5$   
 $(m + 1)(m + 5)$   
 $(x^2 + 1)(x^2 + 5)$  *answer*

$(x^2)^2 + 10x^2 + 9$   
 $m^2 + 10m + 9$   
 $(m + 1)(m + 9)$   
 $(x^2 + 1)(x^2 + 9)$