P.3.6 Rationalizing Denominators & Conjugates

Date________________ Period____

1) NOTES: ______________________________ involves rewriting a radical expression as an equivalent expression in which the _______________ no longer contains any radicals.

If the denominator consists of the square root of a natural number that is not a perfect square, ____________ the numerator and the denomiator by the ____________ number that produces the square root of a perfect square in the denominator.

Simplify.

2) $\frac{5}{\sqrt{5}}$

3) $-\frac{6}{\sqrt{2}}$

4) $\frac{6}{\sqrt{3}}$

5) $\frac{2}{\sqrt{3}}$

6) $\frac{2}{\sqrt{7}}$

7) $\frac{7}{\sqrt{6}}$

8) $\frac{4}{\sqrt{5}}$

9) $\frac{4}{\sqrt{6}}$

10) $\frac{7}{\sqrt{5}}$

11) $-\frac{4}{\sqrt{7}}$

12) NOTES: Radical expressions that involve the sum and difference of the ___________________________ are called conjugates. Conjugates are used to rationalize denominators because the product of such a pair contains no ____________.

Multiplying Conjugates:

$$\left(\sqrt{a}+\sqrt{b}\right)\left(\sqrt{a}-\sqrt{b}\right)=\left(\sqrt{a}\right)^2-\left(\sqrt{b}\right)^2=a-b$$

Simplify.

13) $\left(\sqrt{5}+1\right)\left(\sqrt{5}-1\right)$

14) $\left(\sqrt{2}+5\right)\left(\sqrt{2}-5\right)$

15) $(\sqrt{2} + 3)(\sqrt{2} - 3)$

16) $(\sqrt{5} + 4)(\sqrt{5} - 4)$

17) $(\sqrt{3} - \sqrt{5})(\sqrt{3} + \sqrt{5})$

18) $(\sqrt{2} + \sqrt{7})(\sqrt{2} - \sqrt{7})$

19) NOTES: To rationalize a denominator containing two terms with one or more square roots, _____________ the numerator and the denominator by the _________________ of the denominator.

Simplify.

20) $\dfrac{2}{5 - \sqrt{2}}$

21) $\dfrac{5}{3 + 4\sqrt{3}}$

22) $\dfrac{2}{3 - \sqrt{5}}$

23) $\dfrac{5}{4 - \sqrt{2}}$

24) $\dfrac{3}{\sqrt{2} + \sqrt{5}}$

25) $\dfrac{4}{-2 - \sqrt{2}}$

26) $\dfrac{3}{3 - 2\sqrt{3}}$

27) $\dfrac{5}{-4 + \sqrt{5}}$