

$$\frac{80}{80} = 100$$

Foundations for College Algebra - MTWF
University of North Georgia
Spring 2016
Exam #3

Name: Key Date: April 22, 2016

State the **Greatest Common Divisor** of the following.

1. 32 and 36

$$\begin{array}{l} 32 = \boxed{2} \cdot \boxed{2} \cdot 2 \cdot 2 \\ 36 = \boxed{2} \cdot \boxed{2} \cdot 3 \cdot 3 \end{array} \left. \vphantom{\begin{array}{l} 32 \\ 36 \end{array}} \right\} \boxed{GCF = 4}$$

2. 63 and 27

$$\begin{array}{l} 63 = \boxed{3} \cdot \boxed{3} \cdot 7 \\ 27 = \boxed{3} \cdot \boxed{3} \cdot 3 \end{array} \left. \vphantom{\begin{array}{l} 63 \\ 27 \end{array}} \right\} \boxed{GCF = 9}$$

3. $56x^3y^4$ and $16x^2y^5$

$$\begin{array}{l} 2 \cdot 2 \cdot 2 \cdot 7 x^3 \boxed{y^4} \\ 2 \cdot 2 \cdot 2 \cdot 2 \cdot \boxed{x^2} y^5 \end{array} \left. \vphantom{\begin{array}{l} 2 \cdot 2 \cdot 2 \cdot 7 x^3 \boxed{y^4} \\ 2 \cdot 2 \cdot 2 \cdot 2 \cdot \boxed{x^2} y^5 \end{array}} \right\} \boxed{GCF = 8x^2y^4}$$

Factor the **GCF** out of the following polynomials.

4. $20v^6w^3 + 36v^5w^4 + 28v^4w^5$

$$4v^4w^3(5v^2 + 9vw + 7w^2)$$

5. $56a(2a - 1) - 21(2a - 1)$

$$(2a - 1)(56a - 21)$$

$$(2a - 1)7(8a - 3)$$

$$7(2a - 1)(8a - 3)$$

Factor the following by **Grouping**.

6. $x^2 - 6x - 3x + 18$

$$x(x-6) - 3(x-6)$$

$$\boxed{(x-6)(x-3)}$$

7. $7x^2 + 14x - 8x - 16$

$$7x(x+2) - 8(x+2)$$

$$\boxed{(x+2)(7x-8)}$$

Factor the following completely.

8. $x^2 - 13x + 36$ $ac = 36$ $b = -13$

$$x^2 - 9x - 4x + 36$$

$$x(x-9) - 4(x-9)$$

$$\boxed{(x-9)(x-4)}$$

$$\begin{array}{r|l} - & - \\ \hline 9 & 4 \end{array}$$

9. $t^2 - 20t + 99$ $ac = 99$ $b = -20$

$$t^2 - 11t - 9t + 99$$

$$t(t-11) - 9(t-11)$$

$$\boxed{(t-11)(t-9)}$$

$$\begin{array}{r|l} - & - \\ \hline 11 & 9 \end{array}$$

10. $5x^2 - 35x - 40$

$$5(x^2 - 7x - 8) \quad ac = -8 \quad b = -7$$

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

$$5[x(x-8) + 1(x-8)]$$

$$\boxed{5(x-8)(x+1)}$$

$$\begin{array}{r|l} - & + \\ \hline 8 & 1 \end{array}$$

$$11. 4w^2 - 16 \quad a = 2w \quad b = 4$$

$$(2w + 4)(2w - 4)$$

$$2(w+2) \cdot 2(w-2)$$

$$\boxed{4(w+2)(w-2)}$$

$$12. 1 - x^2 \quad a = 1 \quad b = x$$

$$\boxed{(1+x)(1-x)}$$

$$13. 27x^3 + 125 \quad a = 3x \quad b = 5$$

$$\boxed{(3x+5)(9x^2 - 15x + 25)}$$

$$14. 1 - x^3 \quad a = 1 \quad b = x$$

$$\boxed{(1-x)(1+x+x^2)}$$

Solve the following equations.

$$15. 2x^2 = 13x - 20$$

$$2x^2 - 13x + 20 = 0 \quad a = 4 \quad b = -13$$

$$2x^2 - 8x - 5x + 20 = 0$$

$$2x(x-4) - 5(x-4) = 0$$

$$(x-4)(2x-5) = 0$$

$$\boxed{\begin{array}{l} \textcircled{1} x = 4 \\ \textcircled{2} x = \frac{5}{2} \end{array}}$$

$$\frac{-}{8} \mid \frac{-}{5}$$

$$16. 25x^2 = 36$$

$$25x^2 - 36 = 0 \quad a = 5x \quad b = 6$$

$$(5x+6)(5x-6) = 0$$

$$\boxed{\begin{array}{l} \textcircled{1} x = -\frac{6}{5} \\ \textcircled{2} x = \frac{6}{5} \end{array}}$$

Simplify completely.

$$17. \frac{6v^{-9}}{-8v^{-4}} = - \frac{3v^4}{4v^5} = \boxed{-\frac{3}{4v}}$$

$$18. \frac{x-3}{x+5} \cdot \frac{2x+10}{x^2-9} = \frac{x-3}{x+5} \cdot \frac{2(x+5)}{(x+3)(x-3)} = \boxed{\frac{2}{x+3}}$$

$$19. \frac{5x^2+4x}{x-1} - \frac{6x+3}{x-1} = \frac{5x^2+4x-6x-3}{x-1} = \frac{5x^2-2x-3}{x-1}$$

$5x^2-2x-3$ $ac = -15$ $b = -2$
 $5x^2-5x+3x-3$ $\frac{-5}{3} \mid \frac{+3}{3}$
 $5x(x-1)+3(x-1)$
 $(x-1)(5x+3)$

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

$$20. \frac{3}{10v} - \frac{4}{5v} \quad LCD = 10v$$

$$\frac{3-4(2)}{10v} = \frac{3-8}{10v} = -\frac{5}{10v} = \boxed{-\frac{1}{2v}}$$