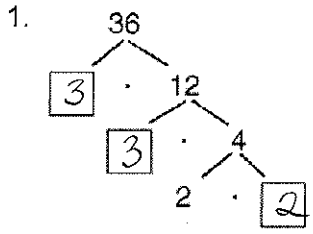


**LESSON**  
**7-1**

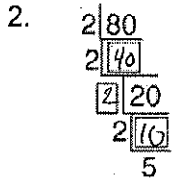
**Practice A**

**Factors and Greatest Common Factors**

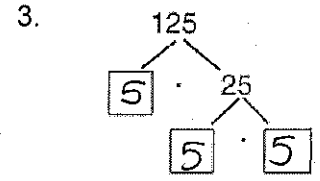
Complete the prime factorization of each number.



$3^2 \cdot 2^2$



$2^4 \cdot 5$



$5^3$

Find the GCF of each pair of numbers.

4. 15 and 40  
 15: 1, 3, 5, 15  
 40: 1, 2, 4, 5, 8, 10, 20, 40  
5

5. 8 and 32  
 8: 1, 2, 4, 8  
 32: 1, 2, 4, 8, ...  
8

6. 36 and 48  
 36: 1, 3, 4, 6, 9, 12, 36  
 48: 1, 2, 3, 4, 6, 8, 12, 16, 24, 48  
12

7. 50 and 75  
 50: 1, 2, 5, 10, 25, 50  
 75: 1, 3, 5, 15, 25, 75  
25

Find the GCF of each pair of monomials.

8.  $12y^3$  and  $15y^2$   
 $3y^2$

9.  $3p^4$  and  $4p$   
 $p$

10.  $18x^6$  and  $24y^2$   
6

11.  $14xy^2$  and  $21y^3$   
 $7y^2$

Mrs. Graham is creating student envelopes for a math activity in her class. She has 64 problems written on pieces of blue paper and 48 problems written on pieces of red paper. She needs to sort the pieces of paper so that each envelope has the same number of pieces and no envelope has both red and blue pieces.

12. If Mrs. Graham puts the greatest possible number of papers in each envelope, how many papers will go in each envelope?

GCF:  
16

13. How many envelopes can Mrs. Graham create if she puts the greatest possible number of papers in each envelope?

7

$\frac{48}{16} = 3$      $\frac{64}{16} = 4$   
 $3 + 4$

**LESSON**  
**7-2**

**Practice A**

**Factoring by GCF**

Factor each polynomial. Check your answer.

check ✓  
 $x^2 + 5x$

1.  $x^2 + 5x$

$x(x + 5)$

check ✓  
 $10y^2 + 12y^3$

4.  $10y^2 + 12y^3$

$2y^2(5 + 6y)$

2.  $5m^3 + 45$

$5(m^3 + 9)$

5.  $-12t^5 + 6t$

$6t(-2t^4 + 1)$

3.  $15y^3 + 20y^5 - 10$

$5(3y^3 + 4y^5 - 2)$

6.  $6x^4 + 15x^3 + 3x^2$

$3x^2(2x^2 + 5x + 1)$

7. A golf ball is hit upward at a speed of 40 m/s. The expression  $-5t^2 + 40t$  gives the approximate height of the ball after  $t$  seconds. Factor this expression.

$5t(-t + 8)$

8. The area of the Hillen family's television screen is  $3x^2 + 24x$  in<sup>2</sup>. Factor this polynomial to find expressions for the dimensions of their TV screen.

$3x(x + 8)$

Factor out the common binomial factor in each expression.

9.  $4d(d + 2) + 9(d + 2)$

$(d + 2)(4d + 9)$

10.  $12(x - 5) + 7x(x - 5)$

$(x - 5)(12 + 7x)$

Factor each polynomial by grouping.

11.  $n^3 + 3n^2 + 4n + 12$

$(n^3 + 3n^2) + (4n + 12)$

$n^2(n + 3) + 4(n + 3)$

$(n + 3)(n^2 + 4)$

12.  $(2x^3 + 5x^2) + (2x + 5)$

$x^2 \cdot 2x + x^2 \cdot 5 + 1 \cdot 2x + 1 \cdot 5$

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

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

Factor each polynomial by grouping and using opposites.

13.  $2y^3 - 4y^2 + 6 - 3y$

$(2y^3 - 4y^2) + (6 - 3y)$

$2y^2(y - 2) + 3(2 - y)$

$2y^2(y - 2) + 3(-1)(y - 2)$

$2y^2(y - 2) - 3(y - 2)$

$(y - 2)(2y^2 - 3)$

14.  $(4m^3 - 12m^2) + (15 - 5m)$

$4m^2 \cdot m - 4m^2 \cdot 3 + 5 \cdot 3 - 5 \cdot m$

$4m^2(m - 3) + 5(3 - m)$

$4m^2(m - 3) - 5(-3 + m)$

$(m - 3)(4m^2 - 5)$

**Practice A****Factoring  $x^2 + bx + c$** 

Factor each trinomial.

1.  $x^2 + 5x + 6$

$(x+2)(x+3)$

2.  $x^2 + 5x + 4$

$(x+4)(x+1)$

3.  $x^2 + 9x + 20$

$(x+4)(x+5)$

4.  $x^2 + 6x - 40$

$(x-4)(x+10)$

5.  $x^2 + 2x - 3$

$(x-1)(x+3)$

6.  $x^2 + 4x - 32$

$(x-4)(x+8)$

7.  $x^2 + 10x - 24$

$(x-2)(x+12)$

8.  $x^2 + 12x - 28$

$(x-2)(x+14)$

9.  $x^2 + 3x - 10$

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

10.  $x^2 - 2x - 15$

$(x-5)(x+3)$

11.  $x^2 - 8x - 20$

$(x-10)(x+2)$

12.  $x^2 - 2x - 48$

$(x-8)(x+6)$

13.  $x^2 - x - 12$

$(x-4)(x+3)$

14.  $x^2 - 2x - 3$

$(x-3)(x+1)$

15.  $x^2 - x - 2$

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