**Factoring Polynomials**

Emphasis on Factoring Quadratics with a = 1

**Completely factor each of the following:**

1. $n^2 - 2n - 3$

$(n-3)(n+1)$

3
+1 −3 = −2

2. $n^2 + 9n - 10$

$(n+10)(n-1)$

10
−1 10 = 9

3. $n^2 + 2n - 80$

$(n+10)(n-8)$

80
1 80
2 40
4 20
5 16
−8 +10 = 2

4. $x^2 + 20x + 100$

$(x+10)(x+10)$

OR

$(x+10)^2$

100
1 100
2 50
4 25
5 20
+10 +10 = 20

5. $x^2 + 10x + 21$

$(x+7)(x+3)$

21
1 21
+3 +7 = 10

6. $k^2 - 8k - 20$

$(k-10)(k+2)$

20
1 20
+2 −10 = −8
4 5

7. $n^2 + 9n + 18$

$(n+6)(n+3)$

18
1 18
2 9
+3 +6 = 9

8. $n^2 + 12n + 20$

$(n+2)(n+10)$

20
1 20
+2 +10 = 12
4 5

9. $x^2 - 6x - 27$

$(x-9)(x+3)$

27
1 27
+3 −9 = −6

10. $m^2 - 3m - 28$

$(m-7)(m+4)$

28
1 28
2 14
+4 −7 = −3

11. $2x^2 - 34x + 144$

$2(x^2 - 17x + 72)$

$2(x-9)(x-8)$

72
1 72
2 36
3 24
4 18
6 12
$-8 - 9 = -17$

12. $6b^2 + 24b - 216$

$6(b^2 + 4b - 36)$

36
1 36
2 18
3 12
4 9
6 6

13. $2v^2 + 14v - 36$

$2(v^2 + 7v - 18)$

$2(v+9)(v-2)$

18
1 18
$-2 + 9 = 7$
3 6

14. $-2v^2 - 24v - 64$

$-2(v^2 + 12v + 32)$

$-2(v+8)(v+4)$

32
1 32
2 16
$+4 + 8 = 12$

15. $6p^2 - 24p - 72$

$6(p^2 - 4p - 12)$

$6(p-6)(p+2)$

12
1 12
$+2 - 6 = -4$
3 4

16. $6n^2 + 72n + 210$

$6(n^2 + 12n + 35)$

$6(n+7)(n+5)$

35
1 35
$+5 + 7 = 12$

17. $6r^2 + 30r - 84$

$6(r^2 + 5r - 14)$

$6(r+7)(r-2)$

14
1 14
$-2 + 7 = 5$

18. $5x^2 - 90x + 405$

$5(x^2 - 18x + 81)$

$5(x-9)(x-9)$

OR

$5(x-9)^2$

81
1 81
3 27
$-9 - 9 = -18$

19. $5x^2 + 15x - 270$

$5(x^2 + 3x - 54)$

$5(x+9)(x-6)$

54
1 54
2 27
3 18
$-6 + 9 = 3$

20. $6m^2 + 18m - 108$

$6(m^2 + 3m - 18)$

$6(m-3)(m+6)$

18
1 18
2 9
$-3 + 6 = 3$