

### 5.3 Trinomials

### Solutions

Factor.													
<b>1.</b> $x^2 + 5x + 6$ $= (x + 2)(x + 3)$	<table border="1"> <tr><td colspan="2">Product 6</td></tr> <tr><td>1</td><td>6</td></tr> <tr><td>2</td><td>3</td></tr> <tr><td colspan="2">Sum 5</td></tr> </table>	Product 6		1	6	2	3	Sum 5					
Product 6													
1	6												
2	3												
Sum 5													
<b>3.</b> $x^2 - 5x + 6$ $= (x - 2)(x - 3)$	<table border="1"> <tr><td colspan="2">Product 6</td></tr> <tr><td>1</td><td>6</td></tr> <tr><td>2</td><td>3</td></tr> <tr><td>-2</td><td>-3</td></tr> <tr><td colspan="2">Sum -5</td></tr> </table>	Product 6		1	6	2	3	-2	-3	Sum -5			
Product 6													
1	6												
2	3												
-2	-3												
Sum -5													
<b>5.</b> $x^2 - 9x + 14$ $= (x - 2)(x - 7)$	<table border="1"> <tr><td colspan="2">Product 14</td></tr> <tr><td>1</td><td>14</td></tr> <tr><td>2</td><td>7</td></tr> <tr><td>-2</td><td>-7</td></tr> <tr><td colspan="2">Sum -9</td></tr> </table>	Product 14		1	14	2	7	-2	-7	Sum -9			
Product 14													
1	14												
2	7												
-2	-7												
Sum -9													
<b>7.</b> $x^2 - 9x + 18$ $= (x - 3)(x - 6)$	<table border="1"> <tr><td colspan="2">Product 18</td></tr> <tr><td>1</td><td>18</td></tr> <tr><td>2</td><td>9</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>-3</td><td>-6</td></tr> <tr><td colspan="2">Sum -9</td></tr> </table>	Product 18		1	18	2	9	3	6	-3	-6	Sum -9	
Product 18													
1	18												
2	9												
3	6												
-3	-6												
Sum -9													
<b>9.</b> $x^2 + 3x - 18$ $= (x - 3)(x + 6)$	<table border="1"> <tr><td colspan="2">Product -18</td></tr> <tr><td>-1</td><td>18</td></tr> <tr><td>-2</td><td>9</td></tr> <tr><td>-3</td><td>6</td></tr> <tr><td colspan="2">Sum 3</td></tr> </table>	Product -18		-1	18	-2	9	-3	6	Sum 3			
Product -18													
-1	18												
-2	9												
-3	6												
Sum 3													
<b>11.</b> $x^2 + 4x - 10$ <b>Prime</b>	<table border="1"> <tr><td colspan="2">Product -10</td></tr> <tr><td>-1</td><td>10</td></tr> <tr><td>-2</td><td>5</td></tr> <tr><td colspan="2">Sum 4</td></tr> </table>	Product -10		-1	10	-2	5	Sum 4					
Product -10													
-1	10												
-2	5												
Sum 4													
<b>2.</b> $x^2 + 8x + 15$													
<b>4.</b> $x^2 - 8x + 15$													
<b>6.</b> $x^2 - 7x + 12$													
<b>8.</b> $x^2 - 7x + 10$													
<b>10.</b> $x^2 + 2x - 15$													
<b>12.</b> $x^2 + 7x - 20$													
Answers: <b>1.</b> $(x + 2)(x + 3)$ ; <b>3.</b> $(x - 2)(x - 3)$ ; <b>5.</b> $(x - 2)(x - 7)$ ; <b>7.</b> $(x - 3)(x - 6)$ ; <b>9.</b> $(x - 3)(x + 6)$ ; <b>11.</b> prime													

Factor.

13.  $x^2 + 5xy - 6y^2$

$(x - y)(x + 6y)$

Product $-6$	
$-1$	$6$
Sum $5$	

14.  $x^2 + 7xy - 8y^2$

15.  $x^2 - xy - 12y^2$

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

Product $-12$	
$-1$	$12$
$-2$	$6$
$-3$	$4$
$3$	$-4$
Sum $-1$	

16.  $x^2 + 11xy - 12y^2$

Factor completely.

17.  $3x^2 - 15x + 18$

$= 3(x^2 - 5x + 6)$

$= 3(x - 2)(x - 3)$

Product $6$	
$1$	$6$
$2$	$3$
$-2$	$-3$
Sum $-5$	

18.  $2x^2 + 4x - 30$

19.  $x^2y + 6xy + 8y$

$= y(x^2 + 6x + 8)$

$= y(x + 2)(x + 4)$

Product $8$	
$1$	$8$
$2$	$4$
Sum $6$	

20.  $4x^2y - 12xy - 40y$

Answers: 13.  $(x - y)(x + 6y)$ ; 15.  $(x + 3y)(x - 4y)$ ; 17.  $3(x - 2)(x - 3)$ ; 19.  $y(x + 2)(x + 4)$

Factor.

21.  $3x^2 + 14x + 8$

Step 1:

Product 24	
1	24
2	12
2	12
Sum 14	

Step 2:

$$= 3x^2 + 2x + 12x + 8$$

Step 4:

$$= (x + 4)(3x + 2)$$

Step 3:

	$3x$	$2$
$x$	$3x^2$	$2x$
$4$	$12x$	$8$

22.  $2x^2 + 7x + 6$

23.  $2x^2 - 11x + 12$

Step 1:

Product 24	
1	24
2	12
3	8
-3	-8
Sum -11	

Step 2:

$$= 2x^2 - 3x - 8x + 12$$

Step 4:

$$= (x - 4)(2x - 3)$$

Step 3:

	$2x$	$-3$
$x$	$2x^2$	$-3x$
$-4$	$-8x$	$12$

24.  $3x^2 - 17x + 10$

Answers: 21.  $(x + 4)(3x + 2)$ ; 23.  $(x - 4)(2x - 3)$

Factor.

25.  $6x^2 - 11x - 10$

Step 1:

Product $-60$	
-1	60
-2	30
-3	20
-4	15
<b>4</b>	<b>-15</b>
Sum $-11$	

Step 2:

$= 6x^2 + 4x - 15x + 10$

Step 4:

$= (2x - 5)(3x + 2)$

Step 3:

	$3x$	$2$
$2x$	$6x^2$	$4x$
$-5$	$-15x$	$10$

26.  $8x^2 - 11x + 3$

27.  $4x^2 + 5x + 2$

Step 1:

Product $8$	
1	8
2	4
Sum $5$	

Step 2:

**Prime**

28.  $6x^2 - 2x + 5$

Answers: 25.  $(2x - 5)(3x + 2)$ ; 27. prime