

## 5.4 Factoring Binomials

## Solutions

Factor. <b>1.</b> $x^2 - 9 = x^2 - 3^2$ $= (x + 3)(x - 3)$	<b>2.</b> $x^2 - 25$
<b>3.</b> $x^2 - a^2 = x^2 - a^2$ $= (x + a)(x - a)$	<b>4.</b> $x^2 - y^2$
<b>5.</b> $25x^2 - 9y^2 = (5x)^2 - (3y)^2$ $= (5x + 3y)(5x - 3y)$	<b>6.</b> $36x^2 - 49y^2$
<b>7.</b> $9x^2 - 1 = (3x)^2 - 1^2$ $= (3x + 1)(3x - 1)$	<b>8.</b> $y^2 - 1$
<b>9.</b> $1 - 4x^2 = 1^2 - (2x)^2$ $= (1 + 2x)(1 - 2x)$	<b>10.</b> $1 - w^2$
<b>11.</b> $x^4 - 16 = (x^2)^2 - 4^2$ $= (x^2 + 4)(x^2 - 4)$ $= (x^2 + 4)(x + 2)(x - 2)$	<b>12.</b> $x^4 - 81$
Answers: <b>1.</b> $(x + 3)(x - 3)$ ; <b>3.</b> $(x + a)(x - a)$ ; <b>5.</b> $(5x + 3y)(5x - 3y)$ ; <b>7.</b> $(3x + 1)(3x - 1)$ ; <b>9.</b> $(1 + 2x)(1 - 2x)$ ; <b>11.</b> $(x^2 + 4)(x + 2)(x - 2)$	

Factor.	
<p>13. <math>x^3 + 8 = x^3 - 2^3</math></p> $= (x + 2)(x^2 - 2x + 2^2)$ $= (x + 2)(x^2 - 2x + 4)$	<p>14. <math>x^3 + 27</math></p>
<p>15. <math>x^3 - 64 = x^3 - 4^3</math></p> $= (x - 4)(x^2 + 4x + 4^2)$ $= (x - 4)(x^2 + 4x + 16)$	<p>16. <math>x^3 - 8</math></p>
Factor completely.	
<p>17. <math>5x^3 - 40y^3 = 5(x^3 - 8y^3) = 5(x^3 - (2y)^3)</math></p> $= 5(x - 2y)(x^2 + 2xy + (2y)^2)$ $= 5(x - 2y)(x^2 + 2xy + 4y^2)$	<p>18. <math>2x^3 + 54y^3</math></p>
<p>19. <math>x^6 - 64 = (x^3)^2 - 8^2</math></p> $= (x^3 + 8)(x^3 - 8)$ $= (x^3 + 2^3)(x^3 - 2^3)$ $= (x + 2)(x^2 - 2x + 2^2)(x - 2)(x^2 + 2x + 2^2)$ $= (x + 2)(x^2 - 2x + 4)(x - 2)(x^2 + 2x + 4)$	<p>20. <math>1 - y^6</math></p>
<p>Answers: 13. <math>(x + 2)(x^2 - 2x + 4)</math>; 15. <math>(x - 4)(x^2 + 4x + 16)</math>; 17. <math>5(x - 2y)(x^2 + 2xy + 4y^2)</math>; 19. <math>(x + 2)(x^2 - 2x + 4)(x - 2)(x^2 + 2x + 4)</math></p>	