

Unit 3B Test Review  
Solving Quadratics

Name:

Factor out the GCF and

Solve:

1.  $3x^2 + 27x = 0$

$3x(x+9) = 0$

$x+9=0$   
 $x=-9$

$x=0$

Factors:  $(3x)(x+9)$

Solutions:

$x=0 + -9$

Solve by factoring:

3.  $x^2 + 5x - 36 = 0$

$(x+9)(x-5) = 0$

$x+9=0$   
 $x=-9$

$x-5=0$   
 $x=5$

Factors:

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

Solutions:

$x = -9 + 5$

2.  $4y^2 - 12y = 0$

$4y(y-3) = 0$

$4y=0$   
 $y=0$

$y-3=0$   
 $y=3$

Factors:  $(4y)(y-3)$

Solutions:

$y=0 + 3$

4.  $3x^2 - 48x + 144 = 0$

$3(x^2 - 16x + 48) = 0$

$3(x-12)(x-4) = 0$

$x-12=0$   
 $x=12$

$x-4=0$   
 $x=4$

Factors:

$3(x-12)(x-4)$

Solutions:

$x = 12, 4$

5.  $6x^2 + 5x - 4 = 0$

$(3x+4)(2x-1) = 0$

$3x+4=0$   
 $3x=-4$   
 $x=-4/3$

$2x-1=0$   
 $2x=1$   
 $x=1/2$

Factors:

$(3x+4)(2x-1)$

Solutions:

$x = -4/3 + 1/2$

Solve by grouping:

7.  $7y^2 - 14y + 9y - 18 = 0$

$7y(y-2) + 9(y-2) = 0$

$(y-2)(7y+9) = 0$

$y-2=0$   
 $y=2$

$7y+9=0$   
 $7y=-9$   
 $y=-9/7$

Factors:

$(y-2)(7y+9)$

Solutions:

$y = 2 + y = -9/7$

6.  $16x^2 + 26x - 12 = 0$

$2(8x^2 + 13x - 6) = 0$

$2(8x-3)(x+2) = 0$

$8x-3=0$   
 $8x=3$   
 $x=3/8$

$x+2=0$   
 $x=-2$

Factors:

$2(8x-3)(x+2)$

Solutions:

$x = 3/8 + -2$

8.  $2x^3 - x^2 - 10x + 5 = 0$

$x^2(2x-1) - 5(2x-1) = 0$

$(2x-1)(x^2-5) = 0$

$2x-1=0$   
 $2x=1$   
 $x=1/2$

$x^2-5=0$   
 $x^2=5$   
 $x=\pm\sqrt{5}$

Factors:

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

Solutions:

$x = 1/2, \pm\sqrt{5}$

Solve by Quadratic Formula

<p>9. <math>6x^2 + x - 2 = 0</math></p> <p><math>a = 6</math> <math>b = 1</math> <math>c = -2</math></p> $x = \frac{-1 \pm \sqrt{(1)^2 - 4(6)(-2)}}{2(6)}$ $x = \frac{-1 \pm \sqrt{49}}{12} = \frac{-1 \pm 7}{12}$ <p>and</p> $x = \frac{-1 - 7}{12} = -\frac{2}{3}$ <p>Factors:</p> <p>Solutions: <math>x = 1/2 \text{ } \&amp; \text{ } -2/3</math></p> <p>Solve by square roots:</p> <p>11. <math>4x^2 = 100</math></p> $\frac{4}{4} \cdot 4x^2 = \frac{100}{4}$ $x^2 = 25$ $x = \pm \sqrt{25}$ $x = \pm 5$ <p>Solutions: <math>x = \pm 5</math></p>	<p>10. <math>3x^2 + 13x = -12</math></p> $x = \frac{-13 \pm \sqrt{(13)^2 - 4(3)(12)}}{3(2)}$ $x = \frac{-13 \pm \sqrt{25}}{6} = \frac{-13 \pm 5}{6}$ <p>and</p> $x = \frac{-13 + 5}{6} = -\frac{4}{3}$ <p>and</p> $x = \frac{-13 - 5}{6} = -3$ <p>Factors:</p> <p>Solutions: <math>x = -4/3 \text{ } \&amp; \text{ } -3</math></p>
<p>12. <math>(4x-3)^2 + 7 = 22</math></p> $-7 \quad -7$ $(4x-3)^2 = 15$ $4x-3 = \pm \sqrt{15}$ $4x = \pm \sqrt{15} + 3$ $x = \frac{\pm \sqrt{15} + 3}{4}$ <p>Solutions: <math>x = \frac{\pm \sqrt{15} + 3}{4}</math></p>	<p>13. <math>5 + 6y^2 = 113</math></p> $6y^2 = 108$ $y^2 = 18$ $y = \pm \sqrt{18}$ $y = \pm 3\sqrt{2}$ <p>Solutions: <math>y = \pm 3\sqrt{2}</math></p> <p>Solve by Completing the Square:</p> <p>15. <math>x^2 - 2x = 8</math></p> $x^2 - 2x = 8$ $x^2 - 2x + 1 = 8 + 1$ $(x-1)(x-1) = 9$ $(x-1)^2 = 9$ $x-1 = \pm \sqrt{9}$ $x-1 = \pm 3$ $x = \pm 3 + 1$ $x = -3 + 1 = -2$ <p>Solutions: <math>x = 4 \text{ } \&amp; \text{ } -2</math></p>

$a=3$   
 $b=13$   
 $c=12$

$(\frac{b}{2})^2 = 1$

<p>14. <math>(x-5)^2 = 36</math></p> $x-5 = \pm \sqrt{36}$ $x-5 = \pm 6$ $x = \pm 6 + 5$ <p>and</p> $x = +6 + 5 = 11$ <p>and</p> $x = -6 + 5 = -1$ <p>Solutions: <math>x = 11 \text{ } \&amp; \text{ } -1</math></p>	<p>16. <math>x^2 + 2x - 33 = 0</math></p> $x^2 + 2x = +33$ $x^2 + 2x + 1 = 33 + 1$ $(x+1)(x+1) = 34$ $(x+1)^2 = 34$ $x+1 = \pm \sqrt{34}$ $x = \pm \sqrt{34} - 1$ <p>Solutions: <math>x = \pm \sqrt{34} - 1</math></p>
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$(\frac{b}{2})^2 =$