

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

# Homework Problem Set

1. Solve the equation for  $b$ :  $2b^2 - 9b = 3b^2 - 4b - 14$ .

$$-9b = b^2 - 4b - 14$$

$$0 = b^2 + 5b - 14$$

$$0 = (b+7)(b-2)$$

$$b = -7, b = 2$$

$$\begin{array}{c} -14 \\ \times \\ 7 \quad -2 \\ \hline 5 \end{array}$$

2. Solve for  $x$ :  $12 = x^2 + 6x$

NOT FACTORABLE

$$0 = x^2 + 6x - 12$$

$$0 = (x^2 + 6x + 9) - 12 - 9$$

$$0 = (x+3)^2 - 21$$

$$\sqrt{21} = \sqrt{(x+3)^2}$$

$$\pm\sqrt{21} = x+3$$

$$-3 \pm \sqrt{21} = x$$

3. Solve for  $x$ :  $4x^2 - 40x + 93 = 0$

$$4(x^2 - 10x + 25) + 93 - 100 = 0$$

$$4(x-5)^2 - 7 = 0$$

$$4(x-5)^2 = 7$$

$$\sqrt{(x-5)^2} = \sqrt{\frac{7}{4}}$$

$$x-5 = \pm \frac{\sqrt{7}}{2}$$

$$x = 5 \pm \frac{\sqrt{7}}{2}$$

Solve each equation by completing the square.

4.  $x^2 - 2x = 12$

$$x^2 - 2x + 1 = 12 + 1$$

$$\sqrt{(x-1)^2} = \sqrt{13}$$

$$x-1 = \pm\sqrt{13}$$

$$x = 1 \pm \sqrt{13}$$

5.  $\frac{1}{2}r^2 - 6r = 2$  (Hint: Consider multiplying every term by 2.)

$$r^2 - 12r = 4$$

$$r^2 - 12r + 36 = 4 + 36$$

$$\sqrt{(r-6)^2} = \sqrt{40}$$

$$r-6 = \pm 2\sqrt{10}$$

$$r = 6 \pm 2\sqrt{10}$$

6.  $\frac{2p^2 + 8p}{2} = \frac{-6}{2}$

$$p^2 + 4p = -3$$

$$(p^2 + 4p + 4) = -3 + 4$$

$$\sqrt{(p+2)^2} = \sqrt{1}$$

$$p+2 = \pm 1$$

$$p = -2 \pm 1$$

$$p = -1, -3$$

7. **Challenge**  $2y^2 + 3y - 5 = 4$

$$2y^2 + 3y = 9$$

$$2\left(y^2 + \frac{3}{2}y + \frac{9}{16}\right) = 9 + \frac{9}{8}$$

$$2\left(y + \frac{3}{4}\right)^2 = \frac{81}{8}$$

$$\sqrt{\left(y + \frac{3}{4}\right)^2} = \sqrt{\frac{81}{16}}$$

$$y + \frac{3}{4} = \pm \frac{9}{4}$$

$$y = -\frac{3}{4} \pm \frac{9}{4}$$

$$y = -3 \quad y = \frac{3}{2}$$

Solve each equation. Use any method.

8.  $p^2 - 2p = 8$

$$p^2 - 2p - 8 = 0$$

$$(p-4)(p+2) = 0$$

$$\begin{array}{r} -8 \\ -4 \quad 2 \\ -2 \end{array}$$

$$p = 4, -2$$

9.  $\frac{2q^2 + 8q}{2} = \frac{4}{2}$

$$q^2 + 4q = 2$$

$$q^2 + 4q + 4 = 2 + 4$$

$$\sqrt{(q+2)^2} = \sqrt{6}$$

$$\sqrt{(q+2)^2} = \sqrt{6}$$

$$q+2 = \pm\sqrt{6}$$

$$q = -2 \pm \sqrt{6}$$

10.  $\frac{1}{3}m^2 + 2m + 8 = 5$

$$m^2 + 6m + 24 = 15$$

$$m^2 + 6m + 9 = 0$$

$$(m+3)(m+3) = 0$$

$$m = -3$$

11.  $-4x^2 = 24x + 11$

$$-4x^2 - 24x = 11$$

$$-4(x^2 + 6x + 9) = 11 - 36$$

$$-4(x+3)^2 = -25$$

$$(x+3)^2 = \frac{25}{4}$$

$$\sqrt{(x+3)^2} = \sqrt{\frac{25}{4}}$$

$$x+3 = \pm\frac{5}{2}$$

$$x = -3 \pm \frac{5}{2}$$

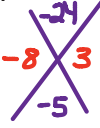
$$x = -\frac{1}{2}, -\frac{11}{2}$$

12. **Challenge** Rewrite the expression by completing the square:  $\frac{1}{2}b^2 - 4b + 13$ .

$$\frac{1}{2}(b^2 - 8b + 16) + 13 - 8$$

$$\frac{1}{2}(b-4)^2 + 5$$

Determine the  $x$ -intercepts of each quadratic function, if there are any.

<p>13. <math>y = (2x - 1)(x + 2)</math></p> $x = \frac{1}{2}, -2$	<p>14. <math>y = x(4x + 1)</math></p> $x = 0, -\frac{1}{4}$	<p>15. <math>y = (x - 7)(2x - 5)</math></p> $x = 7, \frac{5}{2}$
<p>16. <math>y = (x - 4)^2 - 1</math></p> $0 = (x - 4)^2 - 1$ $\sqrt{1} = \sqrt{(x - 4)^2}$ $\pm 1 = x - 4$ $4 \pm 1 = x$ $x = 5, 3$	<p>17. <math>y = 2(x + 3)^2 - 2</math></p> $0 = 2(x + 3)^2 - 2$ $2 = 2(x + 3)^2$ $\sqrt{1} = \sqrt{(x + 3)^2}$ $\pm 1 = x + 3$ $-3 \pm 1 = x$ $x = -2, -4$	<p>18. <math>y + 16 = (x - 2)^2</math></p> $0 + 16 = (x - 2)^2$ $\sqrt{16} = \sqrt{(x - 2)^2}$ $\pm 4 = x - 2$ $2 \pm 4 = x$ $x = 6, -2$
<p>19. <math>y = 3x^2 - 7x</math></p> $y = x(3x - 7)$ $x = 0, \frac{7}{3}$	<p>20. <math>y = x^2 - 5x - 24</math></p> $0 = (x - 8)(x + 3)$ $x = 8, -3$ 	<p>21. <math>y = 25x^2 - 1</math></p> $0 = (5x + 1)(5x - 1)$ $x = \pm \frac{1}{5}$