

Assignment

Date _____ Period _____

Solve each equation by taking square roots.

1) $9b^2 + 7 = 88$

$9x^2 = 81$

$x^2 = 9$

$x = \pm\sqrt{9}$

$x = \pm 3$

2) $3n^2 + 1 = 241$

$3x^2 = 240$

$x^2 = 80$

$x = \pm\sqrt{80} \rightarrow \sqrt{16 \cdot 5}$

$x = \pm 4\sqrt{5}$

3) $10m^2 + 2 = 992$

$10m^2 = 990$

$x^2 = 99$

$x = \pm\sqrt{99} \quad \sqrt{9 \cdot 11}$

$x = \pm 3\sqrt{11}$

4) $81n^2 + 6 = 10$

$81x^2 = 4$

$x^2 = \frac{4}{81}$

$x = \pm\sqrt{\frac{4}{81}}$

$x = \pm \frac{2}{9}$

Solve each equation by completing the square.

5) $x^2 - 4x - 71 = 0$

$x^2 - 4x = 71$

$x^2 - 4x + 4 = 71 + 4$

$(x-2)^2 = 75$

$x-2 = \pm\sqrt{75}$

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

$x = 2 \pm 5\sqrt{3}$

6) $r^2 - 20r - 12 = 0$

$r^2 - 20r = 12$

$r^2 - 20r + 100 = 12 + 100$

$(r-10)^2 = 112$

$r-10 = \pm\sqrt{112} \quad \sqrt{16 \cdot 7}$

$r-10 = \pm 4\sqrt{7}$

$r = 10 \pm 4\sqrt{7}$

7) $3a^2 + 6a - 74 = -2$

$\frac{3a^2 + 6a}{3} = \frac{72}{3}$

$a^2 + 2a = 24$

$a^2 + 2a + 1 = 24 + 1$

$(a+1)^2 = 25$

$a+1 = \pm\sqrt{25}$

$a+1 = \pm 5$

$a = -1 \pm 5 = -6, 4$

8) $9x^2 - 18x + 8 = 3$

$9x^2 - 18x = -5$

$x^2 - 2x = -\frac{5}{9}$

$x^2 - 2x + 1 = -\frac{5}{9} + 1$

$(x-1)^2 = \frac{4}{9}$

$x-1 = \pm\sqrt{\frac{4}{9}}$

$x-1 = \pm \frac{2}{3}$

$x = 1 \pm \frac{2}{3} = \frac{5}{3}, \frac{1}{3}$

$$9) 4n^2 + 4n - 5 = 0$$

$$4n^2 + 4n = 5$$

$$n^2 + n = \frac{5}{4}$$

$$n^2 + n + \frac{1}{4} = \frac{5}{4} + \frac{1}{4}$$

$$(n + \frac{1}{2})^2 = \frac{3}{2}$$

$$n + \frac{1}{2} = \pm \sqrt{\frac{3}{2}}$$

$$n = -\frac{1}{2} \pm \frac{\sqrt{3}}{\sqrt{2}}$$

$$n = -\frac{1}{2} \pm \frac{\sqrt{6}}{2}$$

Rewrite the given equation in vertex form by completing the square.

$$11) y = x^2 - 8x + 14$$

$$y = x^2 - 8x + \boxed{16} + 14 - \boxed{16}$$

$$y = (x-4)^2 - 2$$

~~$$10) 3x^2 - 5x - 1 = 0$$~~

~~$$3x^2 - 5x = 1$$~~

~~$$x^2 - \frac{5}{3}x = \frac{1}{3}$$~~

$$12) y = -x^2 + 8x - 17$$

$$-y = x^2 - 8x + 17$$

$$-y = x^2 - 8x + \boxed{16} + 17 - \boxed{16}$$

$$-y = (x-4)^2 + 1$$

$$y = -(x-4)^2 - 1$$

$$13) y = -x^2 + 4x - 1$$

$$-y = x^2 - 4x + 1$$

$$-y = x^2 - 4x + \boxed{4} + 1 - \boxed{4}$$

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

$$y = -(x-2)^2 + 3$$

$$14) y = -2x^2 + 12x - 19$$

$$\frac{y}{-2} = x^2 - 6x + \frac{19}{2}$$

$$\frac{y}{-2} = x^2 - 6x + \boxed{9} + \frac{19}{2} - \boxed{9}$$

$$\frac{y}{-2} = (x-3)^2 + \frac{1}{2}$$

$$y = -2(x-3)^2 - 1$$