College Math

Name ANSWER KEY

Date _____

Solving Quadratics - Practice Quiz

Solve each equation by taking square roots.

1) $17x^2 + 17 = 5525$

$-17 \quad -17$

$\frac{17x^2}{17} = \frac{5508}{17}$

$x^2 = 324$

$x = \pm\sqrt{324}$

$\boxed{x = \pm 18}$

2) $81x^2 + 6 = 150$

$81x^2 = 144$

$x^2 = \frac{144}{81}$

$x = \pm\sqrt{\frac{144}{81}} = \frac{\pm\sqrt{144}}{\sqrt{81}} = \pm\frac{12}{9} = \boxed{\pm\frac{4}{3}}$

Solve each equation by factoring.

3) $n^2 + 5n - 24 = 0$

$(n+8)(n+-3) = 0$

$n+8=0 \quad n+-3=0$

$\boxed{n=-8} \quad \boxed{n=3}$

4) $n^2 + 2n - 3 = 0$

$(n+3)(n+-1) = 0$

$n+3=0 \quad n+-1=0$

$\boxed{n=-3} \quad \boxed{n=1}$

5) $-x^2 + 7x = -2x^2 + 3x + 32$

$+2x \quad -3x \quad +2x^2 \quad -3x \quad -32$

$x^2 + 4x - 32 = 0$

$(x+8)(x+-4) = 0$

$x+8=0 \quad x+-4=0$

$\boxed{x=-8} \quad \boxed{x=4}$

6) $m^2 - 4m - 37 = -5$

$+5 \quad +5$

$m^2 - 4m - 32 = 0$

$(m+-8)(m+4) = 0$

$m+-8=0 \quad m+4=0$

$\boxed{m=8} \quad \boxed{m=-4}$

7) $n^2 + 5n + 13 = 7$

$-7 \quad -7$

$n^2 + 5n + 6 = 0$

$(n+2)(n+3) = 0$

$n+2=0 \quad n+3=0$

$\boxed{n=-2} \quad \boxed{n=-3}$

8) $-2n^2 = 8n - 15 - 3n^2$

$+3n^2 \quad -8n \quad +15 \quad +3n^2$

$n^2 - 8n + 15 = 0$

$(n+-3)(n+-5) = 0$

$n+-3=0 \quad n+-5=0$

$\boxed{n=3} \quad \boxed{n=5}$

9) $6p^2 - 19p - 20 = 0$ ⊕ -19 ⊛ -120

$(6p^2 - 24p) + (5p - 20) = 0$

$6p(p-4) + 5(p-4) = 0$

$(6p+5)(p-4) = 0$

$6p+5=0$ $\quad$ $p-4=0$

$6p=-5$ $\quad$ $p=4$

$p=-\frac{5}{6}$

10) $7x^2 + 18x + 8 = 0$ ⊕ 18 ⊛ 56

$(7x^2+4x) + (14x+8) = 0$

$x(7x+4) + 2(7x+4) = 0$

$(x+2)(7x+4) = 0$

$x+2=0$ $\quad$ $7x+4=0$

$x=-2$ $\quad$ $7x=-4$

$x=-\frac{4}{7}$

11) $7x^2 + 46x + 24 = 0$ ⊕ 46 ⊛ 168

$(7x^2+4x) + (42x+24) = 0$

$x(7x+4) + 6(7x+4) = 0$

$(x+6)(7x+4) = 0$

$x+6=0$ $\quad$ $7x+4=0$

$x=-6$ $\quad$ $7x=-4$

$x=-\frac{4}{7}$

12) $3x^2 + 31x + 56 = 0$ ⊕ 31 ⊛ 168

$(3x^2+24x) + (7x+56) = 0$

$3x(x+8) + 7(x+8) = 0$

$(3x+7)(x+8) = 0$

$3x+7=0$ $\quad$ $x+8=0$

$3x=-7$ $\quad$ $x=-8$

$x=-\frac{7}{3}$

13) $6x^2 + 8x - 6 = 2$ $\quad -2 \quad -2$

$6x^2 + 8x - 8 = 0$ ⊕ 8 ⊛ -48

$(6x^2+12x) + (4x-8) = 0$

$6x(x+2) - 4(x+2) = 0$

$(6x-4)(x+2) = 0$

$6x-4=0$ $\quad$ $x+2=0$

$6x=4$ $\quad$ $x=-2$

$x=\frac{4}{6}=\frac{2}{3}$

14) $6a^2 - 21a + 16 = -2$ $\quad +2 \quad +2$

$6a^2 - 21a + 18 = 0$ ⊕ -21 ⊛ 108

$(6a^2 - 9a) + (-12a + 18) = 0$

$3a(2a-3) + -6(2a-3) = 0$

$(3a-6)(2a-3) = 0$

$3a-6=0$ $\quad$ $2a-3=0$

$3a=6$ $\quad$ $2a=3$

$a=2$ $\quad$ $a=\frac{3}{2}$

15) $4n^2 + 12 = -14n$ $\quad +14n$

$4n^2 + 14n + 12 = 0$ ⊕ 14 ⊛ 48

$(4n^2+6n) + (8n+12) = 0$

$2n(2n+3) + 4(2n+3) = 0$

$(2n+4)(2n+3) = 0$

$2n+4=0$ $\quad$ $2n+3=0$

$2n=-4$ $\quad$ $2n=-3$

$n=\frac{-4}{2}=-2$ $\quad$ $n=-\frac{3}{2}$

16) $5k^2 + 8k + 3 = -k^2 - k$ $\quad +k^2 \quad +k$

$6k^2 + 9k + 3 = 0$ ⊕ 9 ⊛ 18

$(6k^2+6k) + (3k+3) = 0$

$6k(k+1) + 3(k+1) = 0$

$(6k+3)(k+1) = 0$

$6k+3=0$ $\quad$ $k+1=0$

$6k=-3$ $\quad$ $k=-1$

$k=\frac{-3}{6}=-\frac{1}{2}$

Solve each equation with the quadratic formula. Simplify your answers.

17) $2k^2 - k - 9 = 0$

a:2 b:-1 c:-9

$$X = \frac{-(-1) \pm \sqrt{(-1)^2 - (4 \cdot 2 \cdot -9)}}{2(2)}$$

$$X = \frac{1 \pm \sqrt{1 - -72}}{4}$$

$$\boxed{X = \frac{1 \pm \sqrt{73}}{4}}$$

18) $5b^2 + 12b - 97 = 11$

a:5 b:12 c:-108

$$X = \frac{-12 \pm \sqrt{12^2 - (4 \cdot 5 \cdot -108)}}{2(5)}$$

$$X = \frac{-12 \pm \sqrt{144 - -2160}}{10}$$

$$X = \frac{-12 \pm \sqrt{2304}}{10}$$

$$X = \frac{-12 \pm 48}{10}$$

① $X = \frac{-12+48}{10}$

$X = \frac{36}{10}$

$\boxed{X = 3.6}$

② $X = \frac{-12-48}{10}$

$X = \frac{-60}{10}$

$\boxed{X = -6}$

19) $2x^2 - 99 = 10x - x^2 - 11$

$+x^2 \quad +11 \quad -10x \quad +x^2 \quad +11$

$3x^2 - 10x - 88 = 0$

a:3 b:-10 c:-88

$$X = \frac{-(-10) \pm \sqrt{(-10)^2 - (4 \cdot 3 \cdot -88)}}{2(3)}$$

$$X = \frac{10 \pm \sqrt{100 - -1056}}{6}$$

$$X = \frac{10 \pm \sqrt{1156}}{6}$$

$$X = \frac{10 \pm 34}{6}$$

① $X = \frac{10+34}{6}$

$X = \frac{44}{6}$

$\boxed{X = \frac{22}{3} = 7.\overline{3}}$

② $X = \frac{10-34}{6}$

$X = \frac{-24}{6}$

$\boxed{X = -4}$