

1	$\{2, -2\}$	✓ ✓	9	$\{-1+2i, -1-2i\}$	✓ ✓
2	$\{3i, -3i\}$	✓ ✓	10	$\{1, -\frac{4}{3}\}$	✓ ✓
3	$\{2\sqrt{2}, -2\sqrt{2}\}$	✓	11	$\{6+\sqrt{3}i, 6-\sqrt{3}i\}$	✓ ✓
4	$\{\sqrt{3}, -\sqrt{3}\}$	✓ ✓	12	$\{1+\sqrt{7}i, 1-\sqrt{7}i\}$	✓ ✓
5	$\{7, -1\}$	✓ ✓	13	$y = (x+2)^2 - 6$	✓ ✓
6	$\{-4+3\sqrt{2}i, -4-3\sqrt{2}i\}$	✓ ✓	14	$y = 2(x+1)^2 - 8$	✓ ✓
7	$\{2+i, 2-i\}$	✓ ✓	15	$y = -(x-3)^2 + 5$	✓ ✓
8	$\{\frac{1}{4} + \frac{\sqrt{7}}{4}i, \frac{1}{4} - \frac{\sqrt{7}}{4}i\}$	✓ ✓	16	$y = -3(x-2)^2 + 7$	✓ ✓

East Los Angeles College
Department of Mathematics
Math 125
Test 3

solutions

Show all work for credit.

Solve the following equations for x by using the square root formula.

1. $x^2 = 4$

2. $x^2 = -9$

3. $3x^2 = 24$

4. $8x^2 - 14 = 10$

5. $(x - 3)^2 = 16$

6. $(x + 4)^2 = -18$

Solve the following equations by using the quadratic formula.

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

8. $2x^2 - x + 7 = 0$

9. $x^2 + 2x + 5 = 0$

10. $3x^2 + x - 4 = 0$

Solve the following equations by completing the square.

11. $x^2 - 12x + 5 = 0$

12. $-3x^2 + 6x - 24 = 0$

Write the following quadratic equations in two variables in graphing format.

$$y = a(x - h)^2 + k$$

13. $y = x^2 + 4x - 2$

14. $y = 2x^2 + 4x - 6$

15. $y = -x^2 + 6x - 4$

16. $y = -3x^2 + 12x - 5$

math 125 Test (3)

(1) $x^2 = 4$

$x = \pm\sqrt{4}$

$x = \pm 2$

(2) $x^2 = -9$

$x = \pm\sqrt{-9}$

$x = \pm 3i$

(3) $\frac{3x^2}{3} = \frac{24}{3}$

$x^2 = 8$

$x = \pm\sqrt{8}$

$\frac{(4) \cdot 2}{2}$

$x = \pm\sqrt{(4) \cdot 2}$

$x = \pm\sqrt{(4)}\sqrt{2}$

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

(4) $8x^2 - 14 = 10$

$+14 +14$

$\frac{8x^2}{8} = \frac{24}{8}$

$x^2 = 3$

$x = \pm\sqrt{3}$

(5) $(x-3)^2 = 16$

$x-3 = \pm\sqrt{16}$

$x-3 = \pm 4$
 $+3 +3$

$x = 3 \pm 4$

$x = 3+4 ; x = 3-4$

$x = 7$

$x = -1$

(6) $(x+4)^2 = -18$

$x+4 = \pm\sqrt{-18}$

$x+4 = \pm\sqrt{(-1)(9)}\sqrt{2}$

$x+4 = \pm\sqrt{-1}\sqrt{(9)}\sqrt{2}$

$x+4 = \pm i \cdot 3\sqrt{2}$
 $-4 -4$

$x = -4 \pm 3\sqrt{2}i$

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

$a=1 ; b=-4 ; c=5$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 5}}{2 \cdot 1}$$

$$x = \frac{4 \pm \sqrt{16 - 20}}{2}$$

$$x = \frac{4 \pm \sqrt{-4}}{2}$$

$$x = \frac{4 \pm 2i}{2}$$

$$x = \frac{4}{2} \pm \frac{2i}{2}$$

$$x = 2 \pm i$$

$$(8) \quad 2x^2 - x + 7 = 0$$

$$a = 2 ; b = -1 ; c = 7$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 \cdot 2 \cdot 7}}{2 \cdot 2}$$

$$x = \frac{1 \pm \sqrt{1 - 56}}{4}$$

$$x = \frac{1 \pm \sqrt{-56}}{4}$$

$$x = \frac{1 \pm \sqrt{-1 \cdot 56}}{4}$$

$$x = \frac{1 \pm \sqrt{56}i}{4}$$

$$(9) \quad x^2 + 2x + 5 = 0$$

$$a = 1 ; b = 2 ; c = 5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 1 \cdot 5}}{2 \cdot 1}$$

$$x = \frac{-2 \pm \sqrt{4 - 20}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16}}{2} \quad 4i$$

$$x = \frac{-2 \pm 4i}{2}$$

$$x = \frac{-2}{2} \pm \frac{4i}{2}$$

$$x = -1 \pm 2i$$

$$(10) \quad 3x^2 + x - 4 = 0$$

$$a = 3 ; b = 1 ; c = -4$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-1 \pm \sqrt{1^2 - 4 \cdot 3 \cdot (-4)}}{2 \cdot 3}$$

$$x = \frac{-1 \pm \sqrt{1 + 48}}{6}$$

$$x = \frac{-1 \pm \sqrt{49}}{6} \quad 7$$

$$x = \frac{-1 \pm 7}{6}$$

$$x = \frac{-1 + 7}{6} ; x = \frac{-1 - 7}{6}$$

$$x = \frac{6}{6} ; x = \frac{-8}{6}$$

$$x = 1$$

$$x = -\frac{4}{3}$$

$$(11) \quad x^2 - 12x + 5 = 0$$

$$(1) \quad \frac{-12}{2} = (-6) \quad (2) \quad (-6)^2 = \underline{\underline{36}}$$

$$\frac{x^2 - 12x + 36 - 36 + 5}{f} = 0$$

$$(x-6)^2 - 31 = 0 \quad ; \quad (x-6)^2 = 31$$

$+31 \quad +31$

$$x-6 = \pm \sqrt{31}$$

$+6 \quad +6$

$$x = 6 \pm \sqrt{31}$$

$$(12) \quad \frac{-3x^2 + 6x - 24}{-3} = 0 \quad ; \quad \frac{-3x^2}{-3} + \frac{6x}{-3} - \frac{24}{-3} = 0$$

$$x^2 - 2x + 8 = 0$$

$$(1) \quad \frac{-2}{2} = (-1) \quad (2) \quad (-1)^2 = \underline{\underline{1}}$$

$$\frac{x^2 - 2x + 1 - 1 + 8}{f} = 0$$

$$(x-1)^2 + 7 = 0$$

$-7 \quad -7$

$$(x-1)^2 = -7$$

$$x-1 = \pm \sqrt{-7}$$

$$x-1 = \pm \sqrt{7}i$$

$+1 \quad +1$

$$x = 1 \pm \sqrt{7}i$$

$$(13) \quad y = x^2 + 4x - 2$$

$$\textcircled{1} \quad \frac{4}{2} = \textcircled{2} \quad \textcircled{2} \quad 2^2 = \boxed{4}$$

$$y = \frac{x^2 + 4x + 4 - 4 - 2}{f \quad a}$$

$$| \quad y = (x+2)^2 - 6 \quad |$$

$$(14) \quad \frac{y}{2} = \frac{2x^2 + 4x - 6}{2} \quad ; \quad \frac{y}{2} = \frac{2x^2}{2} + \frac{4x}{2} - \frac{6}{2}$$

$$\frac{y}{2} = x^2 + 2x - 3 \quad \textcircled{1} \quad \frac{2}{2} = \textcircled{1} \quad \textcircled{2} \quad 1^2 = \boxed{1}$$

$$\frac{y}{2} = \frac{x^2 + 2x + 1 - 1 - 3}{f \quad a}$$

$$\frac{y}{2} = (x+1)^2 - 4 \quad ; \quad y = 2[(x+1)^2 - 4]$$

$$| \quad y = 2(x+1)^2 - 8 \quad |$$

$$(15) \quad \frac{y}{-1} = \frac{-x^2 + 6x - 4}{-1} \quad ; \quad \frac{y}{-1} = \frac{-x^2}{-1} + \frac{6x}{-1} - \frac{4}{-1}$$

$$\frac{y}{-1} = x^2 - 6x + 4 \quad \textcircled{1} \quad \frac{-6}{2} = \textcircled{-3} \quad \textcircled{2} \quad (-3)^2 = \boxed{9}$$

$$\frac{y}{-1} = \frac{x^2 - 6x + 9 - 9 + 4}{f \quad a}$$

$$\frac{y}{-1} = (x-3)^2 - 5 \quad ; \quad y = -[(x-3)^2 - 5]$$

$$| \quad y = -(x-3)^2 + 5 \quad |$$

$$(16) \quad \frac{y}{-3} = \frac{-3x^2 + 12x - 5}{-3}$$

$$\frac{y}{-3} = \frac{-3x^2}{-3} + \frac{12x}{-3} - \frac{5}{-3}$$

$$\frac{y}{-3} = x^2 - 4x + \frac{5}{3} \quad \text{① } -\frac{4}{2} = \textcircled{-2}$$

$$\text{② } (-2)^2 = \boxed{4}$$

$$\frac{y}{-3} = \frac{x^2 - 4x + 4 - 4}{f} + \frac{5}{3}$$

$$\frac{y}{-3} = (x-2)^2 - 4 + \frac{5}{3}$$

$$\text{note: } -\frac{4}{1} + \frac{5}{3} = -\frac{4 \cdot 3}{1 \cdot 3} + \frac{5}{3}$$

$$= -\frac{12}{3} + \frac{5}{3}$$

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

$$\frac{y}{-3} = (x-2)^2 - \frac{7}{3} ; y = -3 \left[(x-2)^2 - \frac{7}{3} \right]$$

$$y = -3(x-2)^2 - 3\left(-\frac{7}{3}\right)$$

$$| y = -3(x-2)^2 + 7 |$$