

Practice Test Chapter 2 (2.4-2.7)

NAME KEY

Add or Subtract the complex numbers

1. $4 + 3i + (-3 - 5i)$
 $1 - 2i$

2. $(-2 - 5i) - (-6 + 4i)$
 $-2 - 5i + 6 - 4i$
 $4 - 9i$

Multiply the expression
 FOIL

3. $(5 + 4i)(7 - 2i)$

$35 - 10i + 28i - 8i^2$
 $35 + 18i + 8$
 $43 + 18i$

4. Rewrite the expression in complex form

$\frac{(4+4i)(3+5i)}{(3-5i)(3+5i)} = \frac{12 + 20i + 12i + 20i^2}{9 - 25i^2}$

~~$\frac{12 + 32i - 20}{9 + 25}$~~

$\frac{-8 + 32i}{34} = \frac{-8}{34} + \frac{32}{34}i$

5. Solve the equation

$2x^2 = -128$
 $x^2 = -64$
 $x = \pm 8i$

6. Factor the expression

$x^2 + 100$
 $(x + 10i)(x - 10i)$

$-\frac{4}{17} + \frac{16}{17}i$

7. Solve $x^2 - 8x + 50 = 0$ by completing the square.

$x^2 - 8x + 16 = -50 + 16$

$(x - 4)^2 = -34$

$x - 4 = \pm \sqrt{-34}$

$x = 4 \pm i\sqrt{34}$

8. Solve $2x^2 + 10x - 3 = 0$ by completing the square.

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

$$x^2 + 5x - \frac{3}{2} = 0$$

$$x^2 + 5x + \frac{25}{4} = \frac{3}{2} + \frac{25}{4}$$

$$\left(x + \frac{5}{2}\right)^2 = \frac{31}{4}$$

$$x + \frac{5}{2} = \pm \sqrt{\frac{31}{4}}$$

$$x = -\frac{5}{2} \pm \frac{\sqrt{31}}{2}$$

9. Use the method of your choice to write the equation in Vertex Form

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

Complete Square

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

$$y + 5 = (x - 1)^2$$

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

$$x = \frac{-b}{2a} = \frac{2}{2(1)} = 1$$

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

$$= 1 - 2 - 4$$

$$= -5$$

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

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

10. Solve the equation by using the quadratic formula

$$5x^2 + 2x + 3 = 0$$

$$a = 5 \quad b = 2 \quad c = 3$$

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

$$-\frac{2}{2(5)} \pm \frac{\sqrt{(2)^2 - 4(5)(3)}}{2(5)}$$

$$-\frac{2}{10} \pm \frac{\sqrt{4 - 60}}{10}$$

$$\sqrt{-56} = \sqrt{4} \cdot \sqrt{14} \cdot \sqrt{-1}$$

$$= 2i\sqrt{14}$$

$$-\frac{1}{5} \pm \frac{\sqrt{-56}}{10}$$

$$-\frac{1}{5} \pm \frac{2i\sqrt{14}}{10}$$

$$-\frac{1}{5} \pm \frac{i\sqrt{14}}{5}$$

11. Solve the equation by using the quadratic formula

$$2x^2 - 3x - 5 = 0$$

$$a = 2 \quad b = -3 \quad c = -5$$

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

$$\frac{3}{4} \pm \frac{\sqrt{(-3)^2 - 4(2)(-5)}}{4}$$

$$\frac{3}{4} \pm \frac{\sqrt{9 - (-40)}}{4}$$

$$\frac{3}{4} \pm \frac{\sqrt{49}}{4}$$

$$\frac{3}{4} \pm \frac{7}{4}$$

$$\frac{3}{4} + \frac{7}{4}$$

$$\frac{10}{4}$$

$$\frac{5}{2}$$

$$\frac{3}{4} - \frac{7}{4}$$

$$-\frac{4}{4}$$

$$-1$$

12. Solve the equation by the method of your choice.

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

ON NEXT PAGE

BONUS

Solve the following system algebraically.

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

$$y = 3x^2 + 3x - 5$$

$$3x^2 + 3x - 5 = 2x - 3$$

$$3x^2 + x - 2 = 0$$

Finish on next page

Factoring

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

$$(3x^2 + 6x) - 5(x+2) = 0$$

$$3x(x+2) - 5(x+2) = 0$$

$$(3x-5)(x+2) = 0$$

$$3x-5=0 \quad x+2=0$$

$$3x=5 \quad x=-2$$

$$x = \frac{5}{3}$$

$$\frac{-30}{6 \pm 5}$$

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

Quad Formula

$$\frac{-1}{2(3)} \pm \frac{\sqrt{1^2 - 4(3)(-10)}}{2(3)}$$

$$-\frac{1}{6} \pm \frac{\sqrt{1 - (-120)}}{6}$$

$$-\frac{1}{6} \pm \frac{\sqrt{121}}{6}$$

$$-\frac{1}{6} \pm \frac{11}{6}$$

$$-\frac{1}{6} + \frac{11}{6}$$

$$-\frac{1}{6} - \frac{11}{6}$$

$$\frac{10}{6}$$

$$-\frac{12}{6}$$

$$\frac{5}{3}$$

$$-2$$

Complete Square

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

$$x^2 + \frac{1}{3}x - \frac{10}{3} = 0$$

$$x^2 + \frac{1}{3}x + \frac{1}{36} = \frac{10}{3} + \frac{1}{36}$$

$$(x + \frac{1}{6})^2 = \frac{121}{36}$$

$$x + \frac{1}{6} = \pm \frac{11}{6}$$

$$x = -\frac{1}{6} \pm \frac{11}{6}$$

$$-\frac{1}{6} + \frac{11}{6}$$

$$-\frac{1}{6} - \frac{11}{6}$$

$$\frac{10}{6}$$

$$-\frac{12}{6}$$

$$\frac{5}{3}$$

$$-2$$

Factor

$$3x^2 + x - 2 = 0$$

$$\frac{-4}{3 \pm 2}$$

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

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

~~3x-2~~

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

$$3x-2=0 \quad x+1=0$$

$$x=-1$$

$$3x=2$$

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

Quad Formula

$$3x^2 + x - 2 = 0$$

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

$$-\frac{1}{6} \pm \frac{\sqrt{1 - (-24)}}{6}$$

$$-\frac{1}{6} \pm \frac{\sqrt{25}}{6}$$

$$-\frac{1}{6} \pm \frac{5}{6}$$

$$-\frac{1}{6} + \frac{5}{6}$$

$$-\frac{1}{6} - \frac{5}{6}$$

$$\frac{4}{6}$$

$$-\frac{6}{6}$$

$$\frac{2}{3}$$

$$-1$$

Complete Square

$$3x^2 + x - 2 = 0$$

$$x^2 + \frac{1}{3}x - \frac{2}{3} = 0$$

$$x^2 + \frac{1}{3}x + \frac{1}{36} = \frac{2}{3} + \frac{1}{36}$$

$$(x + \frac{1}{6})^2 = \frac{25}{36}$$

$$x + \frac{1}{6} = \pm \frac{5}{6}$$

$$x = -\frac{1}{6} \pm \frac{5}{6}$$

$$-\frac{1}{6} + \frac{5}{6}$$

$$-\frac{1}{6} - \frac{5}{6}$$

$$\frac{4}{6}$$

$$-\frac{6}{6}$$

$$\frac{2}{3}$$

$$-1$$