

Practice Test -Chapter 3

Date Sofia Castiñeira

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Per. 6

1. Find $\sqrt{-28} \rightarrow \sqrt{4} \cdot \sqrt{7} \cdot \sqrt{-1}$
 $4 \cdot 7 = 28$
 $= 2 \cdot \sqrt{7} \cdot i \rightarrow \boxed{2i\sqrt{7}}$

Solve the equation.

2. $x^2 = 25$
 $\sqrt{x^2} = \sqrt{25}$
 $x = \pm 5$

3. $x^2 - 17x = -72$
 $+72 +72$
 $x^2 - 17x + 72 = 0$
 $(x-9)(x-8) = 0$
 $x-9=0 \quad x-8=0$
 $x=9 \quad x=8$

4. $a=2 \quad b=4 \quad c=4$
 $2x^2 + 4x + 4 = 0$
 $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $\frac{-4 \pm \sqrt{(4)^2 - 4(2)(4)}}{2(2)} \rightarrow \frac{-4 \pm \sqrt{16 - 32}}{4}$
 $= \frac{-4 \pm \sqrt{-16}}{4} = \frac{-4 \pm \sqrt{16} \cdot \sqrt{-1}}{4} = \frac{-4 \pm 4i}{4}$

Evaluate the expression. Write your answer in standard form.

5. $(8 + 9i) + (-5 + 4i)$
 $= \boxed{3 + 13i}$

6. $(8 - 9i)(-5 + 6i)$
 $-40 + 48i + 45i - 54i^2$
 $-40 + 48i + 45i - 54(-1)$
 $= \boxed{14 + 93i}$

7. Solve $x^2 + 4x = -13$ using the Quadratic Formula.
 $x^2 + 4x + 13 = 0$
 $a=1 \quad b=4 \quad c=13$
 $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{-4 \pm \sqrt{4^2 - 4(1)(13)}}{2(1)} = \frac{-4 \pm \sqrt{-36}}{2} = \frac{-4 \pm 6i}{2} = -2 \pm 3i$
 $x = \boxed{-2 \pm 3i}$

8. Solve the system.

$-x^2 - 6x - y = 13 \rightarrow y = -x^2 - 6x - 13$

$3x^2 + 18x - y = -19 \rightarrow y = 3x^2 + 18x + 19$

$-x^2 - 6x - 13 = 3x^2 + 18x + 19$
 $-4x^2 - 24x - 32 = 0 \rightarrow x^2 + 6x + 8 = 0$
 $(x+4)(x+2) = 0$
 $x = -4 \quad x = -2$

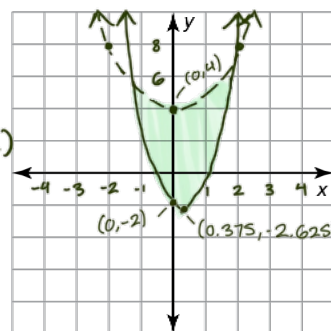
Solutions: $(-4, -5), (-2, -5)$

9. Graph the system of quadratic inequalities.

$y < x^2 + 4 \rightarrow < = \text{shade} \quad y \text{ int: } (0, 4)$

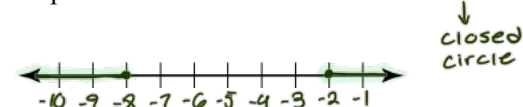
$y \geq 4x^2 - 3x - 2 \rightarrow \geq = \text{shade} \quad y \text{ int: } (0, -2)$

$y < x^2 + 4$
 $a=1 \quad b=0 \quad c=4$
 $x = \frac{-b}{2a} = \frac{0}{2(1)} = 0 \quad \text{Vertex} = (0, 4)$
 $x = -2$
 $y = (-2)^2 + 4 = 8 \quad (-2, 8)$



$y \geq 4x^2 - 3x - 2$
 $a=4 \quad b=-3 \quad c=-2$
 $x = \frac{-b}{2a} = \frac{-(-3)}{2(4)} = \frac{3}{8} = 0.375$
 $y = 4(0.375)^2 - 3(0.375) - 2$
 $= 0.5 - 1.125 - 2$
 $= -2.625$
 $\text{Vertex: } (0.375, -2.625)$
 $y \text{ int: } (0, -2)$

10. Graph the solution of $x^2 + 10x + 16 \geq 0$.



$x^2 + 10x + 16 = 0$
 $(x+8)(x+2) = 0$
 $x = -8 \quad x = -2$
 $x \leq -8 \text{ or } x \geq -2$

Test point: $x = -5$

$x^2 + 10x + 16 \geq 0$
 $(-5)^2 + 10(-5) + 16 \geq 0$
 $25 - 50 + 16 \geq 0$
 $-9 \geq 0 \quad \times \text{false}$