

Name: Key - Answers Only!

Date: _____

Unit 1 Review

* Show work for credit!

Factor completely

1. $x^2 + 10x + 24$

$(x+6)(x+4)$

2. $3x^2 - 15x - 72$

$3(x-8)(x+3)$

3. $2x^2 + 32$

$2(x+4i)(x-4i)$

4. $16x^2 - 81$

$(4x-9)(4x+9)$

Solve each quadratic equation using the indicated method

5. Quadratic Formula: $5x^2 = -6x - 1$

$= \frac{-6 \pm \sqrt{16}}{10}$

$x = -1, \frac{1}{5}$

6. Completing The Square: $x^2 + 4x - 12 = 0$

$(x+2)^2 = 16$

$x = -6, 2$

7. Factoring: $3x^2 - 17x - 6 = 0$

$(3x+1)(x-6) = 0$

$x = -\frac{1}{3}, 6$

8. Square Roots: $2(x-3)^2 + 10 = 24$

$(x-3)^2 = 7$

$x = 3 \pm \sqrt{7}$

Perform the following operation:

9. $(12+14i) - (17+8i)$

$-5 + 6i$

10. $(3-2i)(4+5i)$

$22 + 7i$

11. $(2+5i)^2$

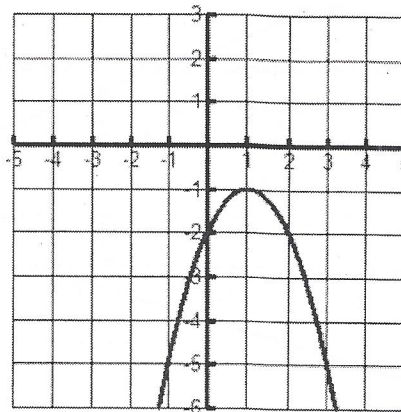
$-21 + 20i$

12. $\frac{-5+2i}{6-3i}$

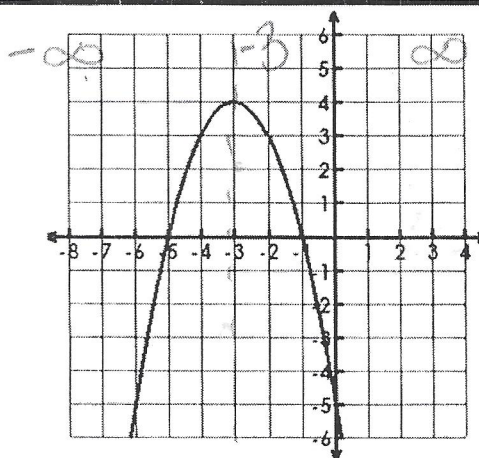
$\frac{-12-i}{15}$ OR \downarrow

$-\frac{4}{5} - \frac{1}{15}i$

13. $-x^2 + 2x = 2$
 Domain $(-\infty, \infty)$ Range $(-\infty, -1]$
 Extrema $(1, -1)$ max AOS $x = 1$
 Inc. $(-\infty, 1)$ Dec $(1, \infty)$
 Y-Int $(0, -2)$ solutions $x = 1 \pm i$
 End Behavior $x \rightarrow -\infty f(x) \rightarrow -\infty$
 $x \rightarrow +\infty f(x) \rightarrow -\infty$



14. Domain $(-\infty, \infty)$ Range $(-\infty, 4]$
 Extrema max @ $(-3, 4)$ AOS $x = -3$
 Inc. $(-\infty, -3)$ Dec $(-3, \infty)$
 Y-Int $(0, -5)$ X-ints $(-5, 0) + (-1, 0)$
 End Behavior $x \rightarrow -\infty f(x) \rightarrow -\infty$
 $x \rightarrow +\infty f(x) \rightarrow -\infty$



15.

	Natural	Whole	Integers	Rational	Irrational	Real	Imaginary	Complex
4/9				✓		✓		✓
8-3i								✓
12	✓	✓	✓	✓		✓		✓

Solve each equation using the best method.

16. $2x^2 + 28 = 4$

Sq. Roots

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

17. $2x^2 - 3x = 2$

Factor

$$x = -\frac{1}{2}, 2$$

18. $x^2 + 8x = -4$

CTS

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

19. $5x^2 + 3x + 1 = 0$

Quad. Formula

$$x = \frac{-3 \pm \sqrt{11}}{10}$$

20. $x^2 - 2x + 10 = 2$

CTS

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

21. $\frac{2}{5}x^2 + 63 = 13$

Sq. Roots

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

22. $-2x^2 + 10x = 15$

Quad. Form.

$$x = \frac{5 \pm i\sqrt{5}}{2}$$

23. $2x^2 + 12x = 0$

Factor (GCF)

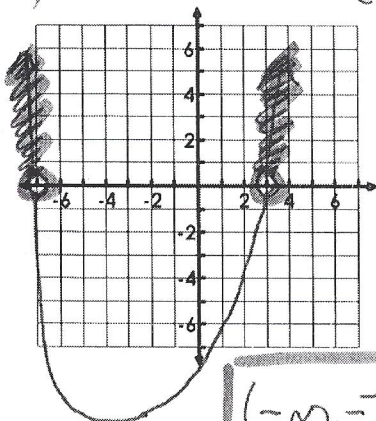
$$x = 0, -6$$

Solve each quadratic inequality. Write final answer in **INTERVAL NOTATION**.

24. $x^2 + 4x - 21 > 0$

open, ()

$$(x+7)(x-3)$$

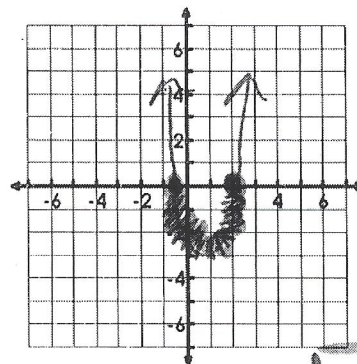


$$(-\infty, -7) \cup (3, \infty)$$

25. $2x^2 - 3x \leq 2$

closed, []

$$(2x+1)(x-2)$$



$$[-\frac{1}{2}, 2]$$

26. You drop a ball off a cliff at 320 ft. How long does it take the ball to hit the ground? $h = -16t^2 + 320$

$$t = 4.47 \text{ seconds}$$

27. A ball is thrown into the air from a height of 256 feet at time $t = 0$. The function that models this situation is $h(t) = -16t^2 + 96t + 256$, where t is measured in seconds and h is the height in feet.

- a. What is the height of the ball at 2 seconds? $h(2) =$

$$\text{At 2 secs. the height is } 384 \text{ feet}$$

- b. When will the ball reach a height of 144 feet?

$$\text{The ball will be 144 ft @ } 7 \text{ seconds}$$

- c. When will the ball hit the ground?

$$\text{The ball will hit the ground @ } 8 \text{ seconds}$$

Need more Review? Extra Practice:

Page 315 #4-19 (skip 17), 24-26, 30-32

Page 318 #2-8, List 9 graphing characteristics for #10, and #14 a-c
