Chapter 5 Test

Form A

(Page 1 of 4 pages)

Name _____

Date _____

1. Solve the equation.

$$-x^2 + 4 = 2x^2 - 5$$

$-2x^2+5=0$

$-3x^2+9=0$

$\frac{9}{3} = \frac{3x^2}{3}$

$x^2 = 3$

$x = \pm\sqrt{3}$

1. $\pm\sqrt{3}$

2. Solve the equation. Round the solutions to two decimal places.

$$5x^2 - 2 = 7$$

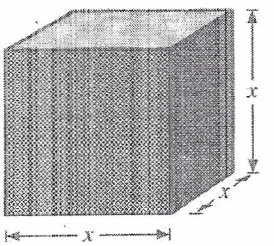
$5x^2 = 9$

$x^2 = \frac{9}{5}$

$x = \pm\sqrt{\frac{9}{5}} =$

2. ± 1.34

3. ***Geometry*** The surface area of a cube is 536 square inches. How long is each edge? (Round to two decimal places.)



$6x^2 = 536$

$x^2 = \pm\sqrt{83.3} = 9.45$ inches

3. 9.45 inches

4. ***Falling Object*** The height, h (in feet), of a falling object on Mars is given by $h = -6t^2 + s$, where t is the time in seconds and s is the initial height in feet. If an object were dropped from a height of 200 feet, how long would it take to reach the ground? (Round to two decimal places.)

$0 = -6t^2 + 200$

$\frac{6t^2}{6} = \frac{200}{6}$ $\quad t^2 = 33.33$ $\quad t = 5.77$ s

4. $t = 5.77$ s

5. Does the parabola open *up* or *down*?

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

5. down

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6. Find the *vertex* and the *axis of symmetry* of the parabola.

$y = 3x^2 + 12x + 9$

$\frac{-b}{2a} = \frac{-12}{2(3)} = -2 = x$

vertex = (-2, -3)

6. axis $x = -2$

$y = 3(-2)^2 + 12(-2) + 9$

$+12 \quad -24 \quad +9$

$y = -3$

7. Sketch the graph of the equation. 1 + 2 + 3

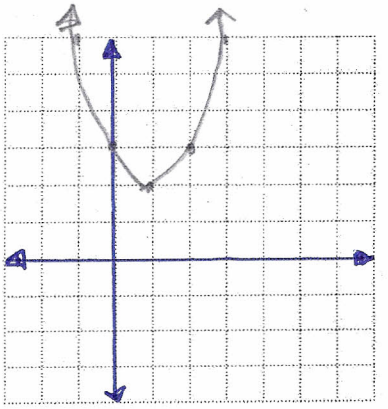
$y = x^2 - 2x + 3$

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

$y = 1 - 2 + 3$

$y = 2$

x	y
0, 2	3
-1, 3	



7. *Use graph at left.*

8. Write the trinomial as the square of a binomial.

$x^2 - 18x + 81$

$(x-9)^2$

8. $(x-9)^2$

9. Solve the equation by completing the square.

$x^2 + 2x - 35 = 0$

$x^2 + 2x + 1 = 35 + 1$

$(x+1)^2 = 36$

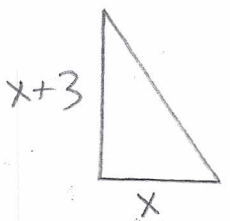
$x + 1 = \pm 6$

$x = -1 \pm 6$

$x = -7, +5$

9. $x = -7, +5$

10. ***Geometry*** The height of a triangle is three feet longer than the base. The area of the triangle is 35 square feet. Find the height and base of the triangle.



$\frac{1}{2} x \cdot (x+3) = 35$

$\frac{x^2}{2} + \frac{3x}{2} = 35$

$x^2 + 3x - 70 = 0$

$a = 1$

$b = 3$

$c = -70$ plug into calculator

$x = -10, +7$

10. base = 7 ft ht = 10 ft

11. State the discriminant of the quadratic. b^2-4ac

$5x^2 - 3x - 12 = 0$

$(-3)^2 - 4(5)(-12)$

$9 + 240 = +249$

11. +249

12. Use the discriminant to determine the number of real solutions of the equation.

$4x^2 - 3x - 7 = 0$

b^2-4ac

$9-4(4)(-7)$

$9+112 = +121$

12. two real roots

13. Use the quadratic formula to solve the equation.

$x^2 + 2x - 1 = 0$ $a=1$ $b=2$ $c=-1$

$\sqrt{8}$ → $\sqrt{4}\ \sqrt{2}$

$x = \dfrac{-(2) \pm \sqrt{4-4(-1)}}{2(1)} = \dfrac{-2 \pm \sqrt{8}}{2} = -1 \pm \sqrt{2}$

13. $-1 \pm \sqrt{2}$

14. Solve the equation. Round to two decimal places.

$0.2x^2 + 0.31x - 0.15 = 0$ $\times 100$

$20x^2 + 31x - 15 = 0$

$a=20$ $b=31$ $c=-15$ use calculator

$x = -1.93, +.39$

14. $x = -1.93, +.39$

15. Write the number using the imaginary unit i.

$\sqrt{-36}$

15. $6i$

16. Simplify the expression.

$(3i)^2 = 3^2 i^2 = 9(-1)$

16. -9

17. Is $-2i$ a solution of $x^2 = -4$?

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

$= \pm 2i$

17. yes

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18. Solve the equation.

$4 - 2x^2 = 12$

$-2x^2 = 8$

$x^2 = -4$

$x = \pm 2i$

18. $\pm 2i$

19. Perform the indicated operations.

$(5 - 2i) - 2(3 + i)$

$5 - 2i - 6 - 2i$

$-1 - 4i$

19. $-1 - 4i$

20. Perform the indicated operations.

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

$2 - 8i + 3i - 12i^2$

$2 - 5i - 12(-1)$

$2 - 5i + 12, \quad 14 - 5i$

20. $14 - 5i$

21. Solve the equation.

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

$a = 2$

$b = 1$

$c = 3$

$x = \dfrac{-1 \pm \sqrt{1 - 4(2)(3)}}{2(2)}$

$x = \dfrac{-1 \pm \sqrt{-23}}{4}$

21. $x = \dfrac{-1}{4} \pm \dfrac{i\sqrt{23}}{4}$

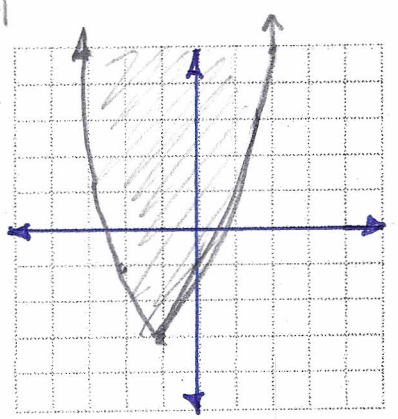
22. Sketch the graph of the inequality.

$y \geq 2x^2 + 4x - 1$

$\dfrac{-4}{2(2)} = x = -1$

$y = -3$

x	y
-2, 0	-1



22. *Use graph at left.*