

# Unit 2 Test

(Chapters 4-6)

SCORE \_\_\_\_\_

For Questions 1-7, simplify. Assume that no denominator equals 0.

1.  $(7x^2 + 3x - 9) - (-x^2 + 8x - 3)$

2.  $5x^3(7x)^2$

3.  $(2x - 3)^2$

4.  $\frac{8y^3 + 27}{2xy - 10y + 3x - 15}$

5.  $\sqrt{16x^2y^4}$

6.  $\sqrt{12} - \sqrt{18} + 3\sqrt{50} + \sqrt{75}$

7.  $\frac{2 + i}{1 - 3i}$

8. Use synthetic division to find  $(2x^3 - 5x^2 + 7x - 1) \div (x - 1)$ .

9. Write the expression  $m^{\frac{7}{5}}$  in radical form.

10. Solve  $\sqrt{3x + 6} + 4 \leq 7$ .

11. Graph  $f(x) = -x^2 + 4x - 3$ , labeling the y-intercept, vertex, and axis of symmetry.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

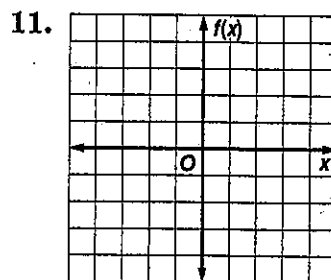
6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_



11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

12. The shape of a supporting arch can be modeled by  $h(x) = -0.03x^2 + 3x$ , where  $h(x)$  represents the height of the arch and  $x$  represents the horizontal distance from one end of the base of the arch in meters. Find the maximum height of the arch.

13. Solve  $2x^2 = 3x + 2$  by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located.

14. Solve  $x^2 - 2x = 24$  by factoring.

15. Write a quadratic equation with  $-\frac{3}{4}$  and 4 as its roots.

Write the equation in the form  $ax^2 + bx + c = 0$ , where  $a$ ,  $b$ , and  $c$  are integers.

16. Find the exact solutions to  $6x^2 + x + 4 = 0$  by using the Quadratic Formula.

17. Find the value of the discriminant for  $9x^2 + 1 = 6x$ . Then describe the number and type of roots for the equation.

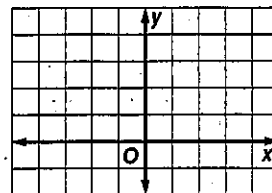
# Unit 2 Test *(continued)*

*(Chapters 4-6)*

18. Identify the vertex, axis of symmetry, and direction of opening for  $y = 2(x + 3)^2 - 5$ . 18. \_\_\_\_\_

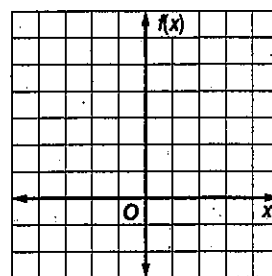
19. Write  $y = -4x^2 + 8x - 1$  in vertex form. 19. \_\_\_\_\_

20. Graph  $y > x^2 - 2x + 1$ . 20. \_\_\_\_\_



21. Find  $p(-3)$  if  $p(x) = x^5 + 3x^2$ . 21. \_\_\_\_\_

22. Graph  $f(x) = -(x)^4 + 4x^2 - 2x$  by making a table of values. Then estimate the  $x$ -coordinates at which the relative maxima and relative minima occur. 22. \_\_\_\_\_



23. Solve  $x^4 + 200 = 102x^2$ . 23. \_\_\_\_\_

24. Use synthetic substitution to find  $f(-3)$  for  $f(x) = 2x^3 - 6x^2 - 5x + 7$ . 24. \_\_\_\_\_

25. One factor of  $f(x) = x^3 + x^2 - 22x - 40$  is  $x + 4$ . Find the other factors. 25. \_\_\_\_\_

26. State the number of positive real zeros, negative real zeros, and imaginary zeros for  $g(x) = 9x^3 - 7x^2 + 10x - 4$ . 26. \_\_\_\_\_

27. List all of the possible rational zeros of  $f(x) = 3x^5 - 7x^3 + 2x - 15$ . 27. \_\_\_\_\_

28. If  $f(x) = 3x$  and  $g(x) = 4x - 3$ , find  $f[g(5)]$  and  $g[f(5)]$ . 28. \_\_\_\_\_

29. Find the inverse of  $f(x) = 7x - 2$ . 29. \_\_\_\_\_

30. Graph  $y \geq \sqrt{3x + 12}$ . 30. \_\_\_\_\_

