Name _____ ID Number _____

# Unit 5 Evaluation

## Advanced Algebra 1 (MTHH 039 058)

This evaluation will cover the lessons in this unit. It is open book, meaning you can use your textbook, syllabus, and other course materials. To submit the evaluation, follow the directions provided.

**Your graphing calculator may be used on this evaluation. You may also use scratch paper to work out the solutions. Select the response that <u>best</u> completes the statement or answers the question.**

____1. For which quadratic function is –3 the constant term?

a. $y = (3x + 1)(-x - 3)$
b. $y = x^2 - 3x + 3$
c. $f(x) = (x - \quad)(x - \quad)$
d. $g(x) = -3x^2 + 3x + 9$

____2. The vertex of a parabola is (3, 2). A second point on the parabola is (1, 7). Which point is also on the parabola?

a. (–1, 7)
b. (3, 7)
c. (5, 7)
d. (3, –2)

____3. The graph of a quadratic function has vertex (–3, –2). What is the axis of symmetry?

a. $x = -3$
b. $x = 3$
c. $y = -2$
d. $y = 2$

____4. Which function is **not** a quadratic function?

a. $y = (x - 1)(x - 2)$

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

c. $y = 3x - x^2$

d. $y = -x^2 + x(x - 3)$

____5. What is the vertex of $y = -2x^2 - 4x - 5$?

a. (–2, –3)
b. (1, –3)
c. (1,–11)
d. (–1, –3)

____6. What is the *y*-intercept of $y = (x + 1)^2 - 2$?

a. (0, –1)
b. (0, –3)
c. (0, 1)
d. (0, –2)

____7. What is the maximum area in square units of a rectangle with a perimeter of 128 units?

a. 4096
b. 1024
c. 256
d. 32

____8. The vertex of the graph of $y = -x^2 - 16x - 62$ lies in which quadrant?

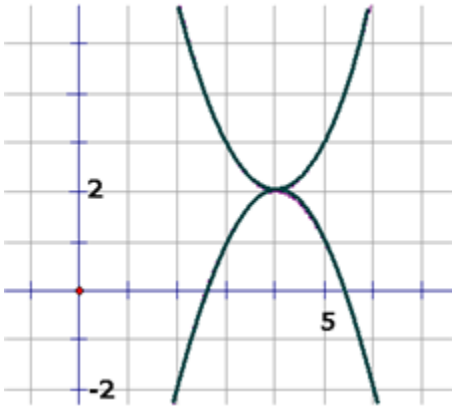
a. IV
b. III
c. II
d. I

____9. What percent of nonzero integers have squares that are odd numbers?

a. 25
b. 50
c. 75
d. 100

____10. One parabola shown here has the equation $y = (x-4)^2 + 2$. What is an equation of the other?

a. $y = -(x-4)^2 + 2$
b. $y = (x+4)^2 - 2$
c. $y = (-x-4)^2 + 2$
d. $y = -(x+4)^2 - 2$




**Use the following information about quadratic functions to answer questions 11– 16**.

**vertex form:** $y = a(x-h)^2 + k$
**standard form:** $y = ax^2 + bx + c$

____11. When $y = -3x^2 - 18x - 23$ is written in vertex form, what is the value of *k*?

a. 4
b. –3
c. 54
d. –18

____12. When $y = 2(x-3)(x+5)$ is written in standard from, what is the value of *b*?

a. 2
b. 4
c. –30
d. 5

____13. When $y = -2(x+3)^2 + 25$ is written in standard form, what is the value of *c*?

a. 2
b. 18
c. 12
d. 7

____14. For $y = -3x^2 - 7x + 5$, what is the *x*-value of the vertex?

a. $-\frac{5}{3}$
b. $\frac{7}{3}$
c. $-\frac{7}{6}$
d. $\frac{6}{5}$

____15. What is the *y*-coordinate of the vertex of $y = -2(x+1)^2 + 3$?

a. –2
b. 1
c. 3
d. 2

____16. How many units down must you shift the graph of $y = 3(x+3)^2$ to get the graph of $y = 3(x+3)^2 - 2$?

a. 2
b. 3
c. 9
d. 6

____17. Which term is **not** a common factor of $4a^2c^2 + 2a^2c - 6ac^2$?

a. $4c$
b. $2a$
c. $2ac$
d. $ac$

____18. How can you write $(m - 5)(m + 4) + 8$ as a product of two binomials?

a. $(m - 1)(m + 8)$
b. $(m - 4)(m + 3)$
c. $(m + 8)(m + 8)$
d. $(m - 5)(8m + 32)$

____19. What is the factored form of $4x^2 + 15x - 4$?

a. $(2x + 2)(2x - 2)$
b. $(2x - 4)(2x + 1)$
c. $(4x + 1)(x - 4)$
d. $(4x - 1)(x + 4)$

____20. Which is a factored form of $0.81p^2 - 0.09$?

a. (0.9*p* + 0.045)(0.9*p* – 0.045)
b. (0.09*p* + 0.03)(0.09*p* – 0.03)
c. (0.9*p* + 0.3)(0.9*p* – 0.3)
d. (0.9*p* + 0.81)(0.9*p* – 0.81)

____21. The period of a pendulum is the time the pendulum takes to swing back and forth one full time. The function $l = 0.81t^2$ relates the length *l* in feet of a pendulum to the time *t* in seconds that it takes to swing back and forth. The convention center in Portland, Oregon, has the longest pendulum in the U.S. The pendulum's length is 90 ft. Find the period for this pendulum.

a. 8.5 seconds
b. 10.5 seconds
c. 90 seconds
d. 111 seconds

____22. What are the values of *x* that satisfy the equation $3 - 27x^2 = 0$?

a. $x = \pm 3$
b. $x = \pm \frac{1}{3}$
c. $x = \frac{1}{9}$ or $x = -\frac{1}{9}$
d. $x = 2\sqrt{6}$ or $x = -2\sqrt{6}$

____23. What are the solutions of the equation $6x^2 + 9x - 15 = 0$?

a. 1, –15
b. $1, -\frac{5}{2}$
c. –1, –5
d. $3, \frac{5}{2}$

____24. For which equation is –3 **not** a solution?

a. $x^2 - 2x - 15 = 0$
b. $x^2 - 21 = 4x$
c. $2x^2 + 12x = -18$
d. $9 + x^2 = 0$

____25. What are the solutions of the equation $(2x-7)^2=25$?

a. 6, –6
b. 6, 1
c. 6, –1
d. –6, –1

____26. Find the sum of the solutions to the equation $x^2+2x-15=0$.

a. 8
b. –8
c. 2
d. –2

____27. Find the product of the solutions to the equation $x^2-8x=9$.

a. 6
b. –6
c. 9
d. –9

____28. Which equation has $-\frac{2}{5}$ as a solution?

a. $(2x-5)(x+1)=0$
b. $(2x+5)(x+1)=0$
c. $(5x-2)(x+1)=0$
d. $(5x+2)(x+1)=0$

____29. How many times does the graph of $y=x^2-4x-5$ cross the *x*-axis?

a. 0
b. 1
c. 2
d. 33

____30. The equation $x^2-3x+a=0$ has two roots. One root of the equation is 2. What is the other root?

a. –2
b. –1
c. 1
d. 3

____31. What is the number $\sqrt{-225}+36$ when written in the form $a+bi$?

a. $-15+6i$
b. $6+15i$
c. $6-15i$
d. $36+15i$

____32. How can you rewrite the expression $(8-5i)^2$ in the form $a + bi$?

a. $39 + 80i$
b. $39 - 80i$
c. $69 + 80i$
d. $69 - 80i$

____33. What are the solutions of $-4x^2 - 72 = 0$?

a. $\pm 2i\sqrt{3}$
b. $\pm 3i\sqrt{2}$
c. $\pm 2\sqrt{3}$
d. $\pm 3\sqrt{2}$

____34. Which description of the graph of $y = ax^2 + bx + c$ is **not** possible?

a. There are two $x$-intercepts, the vertex is below the $x$-axis, and $a > 0$.
b. There is one $x$-intercept and the vertex is on the $x$-axis.
c. There are two $x$-intercepts, the vertex is below the $x$-axis, and $a < 0$.
d. There are no $x$-intercepts, the vertex is above the $x$-axis, and $a > 0$.

____35. What can you add to $x^2 + 5x$ to get a perfect square trinomial?

a. 5
b. 6.25
c. 25
d. $2.5x$

____36. How can you rewrite the equation $x^2 + 12x + 5 = 3$ so the left side of the equation is in the form $(x + a)^2$?

a. $(x - 6)^2 = 28$
b. $(x + 6)^2 = 34$
c. $(x + 6)^2 = 39$
d. $(x + 12)^2 = -2$

____37. What is the discriminant of $qx^2 + rx + s = 0$?

a. $|a + b|$
b. $q^2 - 4rs$
c. $r^2 - 4qs$
d. $s^2 - 4qr$

____38. How many different real solutions are there for $2x^2 - 3x + 5 = 0$ ?

a. 0
b. 1
c. 2
d. i

____39. Which equation has $-3 \pm 5i$ as its solutions?

a. $x^2 + 6x = -34$
b. $x^2 + 6x = -14$
c. $x^2 + 3x = 4$
d. $x^2 + 3x = 2$

____40. If a quadratic equation has a discriminant that equals zero, which of the following statements is always true?

a. The equation has two solutions and the parabola will open upward.
b. The equation has one solution and the parabola will open downward.
c. The equation has zero solutions and there is not enough information to determine the direction of the parabola.
d. The equation has one solution and there is not enough information to determine the direction of the parabola.

**Carefully check your answers on this evaluation and make any corrections you feel are necessary. When you are satisfied that you have answered the questions to the best of your ability, transfer your answers to an answer sheet. Please refer to the information sheet that came with your course materials.**