

Algebra II 1.0

MULTIPLE CHOICE

1. What is the complete solution to the inequality $|5x - 6| > 9$?

A $x > -\frac{3}{5}$ or $x < 3$

C $x > 3$ or $x < -\frac{3}{5}$

B $x > -3$ or $x < \frac{3}{5}$

D $x < 3$ or $x > -\frac{3}{5}$

STA: (Key)1.0

2. What is the complete solution to the equation $|9 - 2x| = 15$?

F $x = -3$; $x = 12$

H $x = -3$; $x = -12$

G $x = -12$; $x = 3$

J There are no solutions.

STA: (Key)1.0

3. What is the complete solution to the equation $|x - 12| = -20$?

A $x = 32$; $x = -8$

C $x = -32$; $x = -8$

B $x = -32$; $x = 8$

D There are no solutions.

STA: (Key)1.0

4. What is the complete solution to the equation $|3 - 4x| + 2 = 0$?

F $x = -\frac{5}{4}$; $x = \frac{1}{4}$

H $x = -\frac{5}{4}$; $x = -\frac{1}{4}$

G $x = -\frac{1}{4}$; $x = \frac{5}{4}$

J There are no solutions.

STA: (Key)1.0

5. What is the complete solution to the equation $|x - 2| + 2x = 1$?

A $x = -1$

C $x = 1$

B $x = 1$ or $x = -1$

D There are no solutions.

STA: (Key)1.0

6. What is the complete solution to the equation $|2 - 2|2 - 5x| \geq 8$?

F $x \leq 0$ and $x \leq \frac{4}{5}$

H $x \leq 0$ and $x \geq -\frac{4}{5}$

G $x \geq 0$ and $x \leq \frac{4}{5}$

J There are no solutions.

STA: (Key)1.0

Algebra II 2.0

MULTIPLE CHOICE

1. What is the solution to the system of equations shown below?

$$\begin{aligned}9x + 3y + 3z &= -12 \\27x + 9y + 9z &= -36 \\-3x - y - z &= 4\end{aligned}$$

- A no solutions
B infinitely many solutions
C $\left(0, 0, \frac{1}{4}\right)$
D $(0, 4, 0)$

STA: (Key)2.0

2. Which system of equations has $(-3, 1)$ as a solution?

- F $2x + y = -5$
G $4x - 5y = -17$
H $4x + 5y = -7$
J $2x - y = -7$
I $3x + y = 8$
K $2x - 3y = -9$
L $x - 3y = 0$
M $x - 4y = 14$

STA: (Key)2.0

3. The perimeter of a playground is 210 yards. What is the width if the length is 3 yards less than 3 times the width?

- A 27 yards
B 35 yards
C 52 yards
D 78 yards

STA: (Key)2.0

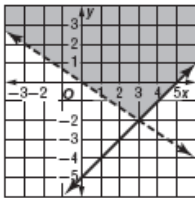
4. What is the solution to the system of equations shown below?

$$\begin{aligned}2a - 3b &= -2 \\-2a + b &= -6\end{aligned}$$

- F $a = 5; b = 4$
G $a = \frac{1}{5}; b = \frac{1}{4}$
H $a = -5; b = -4$
J There are no solutions.

STA: (Key)2.0

5. What system of inequalities *best* represents the graph shown below?



- A $2x + 3y < 0$ and $x - y \geq 5$
B $2x + 3y \geq 0$ and $x - y < 5$
C $2x + 3y < 0$ and $x - y \leq 5$
D $2x + 3y > 0$ and $x - y \leq 5$

STA: (Key)2.0

6. Which is the inverse of the coefficient matrix for the following system of equations?

$$\begin{aligned}x + 3y &= 6 \\ 2x - y &= 5\end{aligned}$$

F $A^{-1} = \begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}$

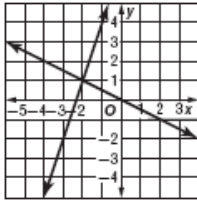
H $A^{-1} = -\frac{1}{7} \begin{bmatrix} -1 & -3 \\ -2 & 1 \end{bmatrix}$

G $A^{-1} = \frac{1}{7} \begin{bmatrix} -1 & -3 \\ -2 & 1 \end{bmatrix}$

J $A^{-1} = -\frac{1}{7} \begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}$

STA: (Key)2.0

7. What system of equalities *best* represents the graph shown below?



A $y = 3x + 7$ and $y = -2x$

C $y = -3x + 7$ and $y = \frac{x}{2}$

B $y = -3x - 7$ and $y = -\frac{2}{x}$

D $y = 3x + 7$ and $y = -\frac{x}{2}$

STA: (Key)2.0

8. A baseball team's manager buys 70 balls for \$260. The balls used for practice cost \$3.50 each, and the balls used in games cost \$4.25 each. How many game balls did the manager buy?

F 20

H 30

G 25

J 50

STA: (Key)2.0

9. Which matrix equation represents the following system of equations?

$$\begin{aligned}3x + 2y + z &= -5 \\ -x - 4y + 6z &= 0 \\ 5x + y - 7z &= 12\end{aligned}$$

A $\begin{bmatrix} x \\ y \\ z \end{bmatrix} \cdot \begin{bmatrix} 3 & 2 & 1 \\ -1 & -4 & 6 \\ 5 & 1 & -7 \end{bmatrix} = \begin{bmatrix} -5 \\ 0 \\ 12 \end{bmatrix}$

C $\begin{bmatrix} 3 & -1 & 5 \\ 2 & -4 & 1 \\ 1 & 6 & -7 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -5 \\ 0 \\ 12 \end{bmatrix}$

B $\begin{bmatrix} 3 & 2 & 1 \\ -1 & -4 & 6 \\ 5 & 1 & -7 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -5 \\ 0 \\ 12 \end{bmatrix}$

D $\begin{bmatrix} 3 & -5 & 2 \\ -1 & 0 & -4 \\ 5 & 12 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 6 \\ -7 \end{bmatrix} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

STA: (Key)2.0

Algebra II 3.0

MULTIPLE CHOICE

1. What is the sum when $(6x^2 - 2x + 5)$ is added to $(-3x^2 + 4x - 9)$?

A $9x^2 - 6x + 14$

C $3x^2 + 2x - 4$

B $3x^2 - 2x + 4$

D $-3x^2 + 2x + 4$

STA: (Key)3.0

2. $3x - 2 \overline{) 6x^2 - 13x + 6}$

F $2x - 3 + \frac{12}{3x - 2}$

H $-2x + 3$

G $2x - 3$

J $2x^2 + 3x + 12$

STA: (Key)3.0

3. Which polynomial represents $(5a - 3b)(-3a - 7b)$?

A $15a^2 + 26ab - 29b^2$

C $-15a^2 + 21b^2 - 26ab$

B $15a^2 + 21b^2 + 26ab$

D $-8a^2 - 26ab + 29b^2$

STA: (Key)3.0

4. $(-3a^2 + 3a - 6) - 3(4a^2 - 7a + 6) =$

F $9a^2 - 18a + 12$

H $-15a^2 - 18a + 24$

G $-15a^2 + 24a - 24$

J $-15a^2 - 4a$

STA: (Key)3.0

5. What is $(27m^2n - 9mn^2 + 3mn) \div (-3m)$?

A $-9mn + 3n^2 + n$

C $9mn - 3n^2 + n$

B $9m^2n - 3mn^2 + n$

D $-9mn + 3n^2 - n$

STA: (Key)3.0

6. $t - 3 \overline{) 2t^3 - 48}$

F $2t^2 - 16$

H $2t^2 + 6t + 18 + \frac{6}{t - 3}$

G $2t^2 + 6t + 18 + \frac{-6}{t - 3}$

J $2t^2 + 6t + 18 + \frac{102}{t - 3}$

STA: (Key)3.0

7. $\left(\frac{3x^2}{x - 2}\right)(5x^2 - 7x - 6) =$

A $15x^3 + 9x^2$

C $15x^3 - 9x^2$

B $15x^3 + 6x^2$

D $\frac{15x^3}{2} + \frac{21x^2}{2} + 9x$

STA: (Key)3.0

8. What is the remainder when $x^2 - 6x + 9$ is divided by $x - 4$?

F 0

H 5

G 1

J 17

STA: (Key)3.0

9. Which polynomial represents $(ab - 9)^2$?

A $a^2b^2 - 18ab + 81$

B $2a^2b^2 - 81$

STA: (Key)3.0

C $a^2b^2 - 9a - 9b + 81$

D $a^2 + b^2 - 9a - 9b + 81$

10. $a^2by - ab^2x - 3abz - a^2by + 7a^2bx =$

F $3a^2b(2x - z)$

G $-6ab^2x - 3abz$

STA: (Key)3.0

H $2a^2by - 6ab^2x - 3abz$

J $3ab(2ax - z)$

11. $\frac{2x^2 - 11x + 18}{-x + 3} =$

A $2x - 5 + \frac{3}{-x + 3}$

B $-2x + 5 + \frac{3}{-x + 3}$

STA: (Key)3.0

C $-2x + 5 - \frac{3}{x + 3}$

D $-2x + 6$

12. Which values for a , b , and c will make the sum of $ax^2 + bx + c$ and $-2x^2 + 3x - 8$ equal 0?

F $a = 2; b = -3; c = 8$

G $a = 2; b = -3; c = \frac{1}{8}$

STA: (Key)3.0

H $a = 0; b = 0; c = 8$

J $a = -2; b = 3; c = -8$

13. Which polynomial represents $(x + 2y)(x + 3y)(x - y)$?

A $x^3 + 5x^2y + 6y^3$

B $x^3 + 4x^2y + xy^2 - 6y^3$

STA: (Key)3.0

C $x^3 + 4xy - 6y^3$

D $x^3 + 4x^2y + 11xy^2 - 6y^3$

14. Which polynomial represents $(2d^2 + 3cd - c^2)$ subtracted from $(6d^2 - 7c^2)$?

F $4d^2 - 3cd - 6c^2$

G $8d^2 + 3cd - 8c^2$

STA: (Key)3.0

H $4d^2 - 3cd - 6c^2$

J $-4d^2 + 3cd - 8c^2$

15. $3(2p^3 - 7p^2 - 1) - \frac{1}{2}(8p^3 + 10p^2 + 6) =$

A $2p^3 + 3p^2 + 5$

B $2p^3 + 16p^2 + 6$

STA: (Key)3.0

C $10p^3 - 16p^2$

D $2p^3 - 26p^2 - 6$

16. $\frac{-9x^2y^2 - 12xy^2 + 6x^2y^3}{3xy} =$

F $-x^2y - 4y$

G $-3x^2y - 4y + 2xy^2$

STA: (Key)3.0

H $-6x^2y - 9y + 9xy^2$

J $3x^2y + 4y - 2xy^2$

Algebra II 4.0

MULTIPLE CHOICE

1. Which product of factors is equivalent to $16y^2 - 24y + 9$?

A $(4y - 3)(4y - 3)$

C $(4y + 12)(4y + 12)$

B $(4y + 3)(4y + 3)$

D $(4y - 9)(4y - 1)$

STA: (Key)4.0

2. What is the complete factorization of $9m^2 - 36n^2$?

F $(3m - 6n)(3m - 6n)$

H $9(m - 2n)(m + 2n)$

G $-27(m - n)(m + n)$

J $3(3m - 6n)(m + 6n)$

STA: (Key)4.0

3. Which product of factors is equivalent to $8s^3 + r^3$?

A $(8s + r)(s^2 - sr + r^2)$

C $(2s - r)(4s^2 + 2sr + r^2)$

B $(2s + r)(4s^2 - 2sr + r^2)$

D $(2s + r)(4s^2 + 2sr - r^2)$

STA: (Key)4.0

4. $p^3 - w^3 =$

F $(p - w)(p^2 + pw + w^2)$

H $(p - w)(p - w)(p + w)$

G $(p + w)(p^2 + pw + w^2)$

J $(p - w)(p^2 + w^2)$

STA: (Key)4.0

5. Which product of factors is equivalent to $x^2 + 13x + 30$?

A $(x + 2)(x + 15)$

C $(x + 3)(x + 10)$

B $(x + 5)(x + 6)$

D $(x - 15)(x + 2)$

STA: (Key)4.0

6. What is the complete factorization of $-4x^5y + 8x^4y^3 + 2x^3y^2 - 4x^2y^4$?

F $-2x^2y(2y^2 - x)(2x^2 - y)$

H $2x^2y(2y^2 + x)(2x^2 + y)$

G $2x^2y(2y^2 - x)(2x^2 - y)$

J $2x^2y(2x^2 - x)(2y^2 - y)$

STA: (Key)4.0

7. Which product of factors is equivalent to $8x^2 + 12x + 18$?

A $2(3x + 2)(3x + 2)$

C $2(3x - 2)(3x - 2)$

B $2(2x - 3)(2x - 3)$

D $2(2x + 3)(2x + 3)$

STA: (Key)4.0

8. The total area of a rectangle is $3n^2 + 9n + 6$. Which factors could represent the length times width?

F $(3n + 2)(3n + 3)$

H $(n + 3)(3n + 2)$

G $(n + 3)(3n + 3)$

J $(n + 2)(3n + 3)$

STA: (Key)4.0

9. Which product of factors is equivalent to $(y + 2)^2 - 9x^2$?

A $(y - 3x + 2)(y + 3x + 2)$

C $(y - 3x - 2)(y - 3x - 2)$

B $(y + 2 + 3x)(y + 2 + 3x)$

D $(y + 2 - 9x)(y + 2 + 9x)$

STA: (Key)4.0

10. What is the complete factorization of $3x^3 - 24$?

F $3(x^3 + 8)$

H $3(x + 2)(x^2 - 2x + 4)$

G $(3x - 6)(x^2 + 2x + 4)$

J $3(x - 2)(x^2 + 2x + 4)$

STA: (Key)4.0

11. $c^3d^3 + 64 =$

A $(cd + 4)(c^2d^2 - 4cd + 16)$

C $(cd + 4)(c^2d^2 - 4cd + 8)$

B $(cd + 4)(c^2d^2 - 2cd + 4)$

D $(cd - 4)(c^2d^2 + 4cd + 8)$

STA: (Key)4.0

12. The area of a square is represented by $9x^2 - 30x + 25$. Which expression could represent one side of the square?

F $(1.5x + 5)$

H $(3x + 5)$

G $(1.5x - 5)$

J $(3x - 5)$

STA: (Key)4.0

13. What is the complete factorization of $0.01x^2 - 0.81$?

A $0.1(x - 3)(x + 27)$

C $(0.1x + 0.9)(0.1x + 0.9)$

B $0.1(x - 9)(x - 9)$

D $0.01(x - 9)(x + 9)$

STA: (Key)4.0

14. What is the complete factorization of $169x^2 + 312xy + 144y^2$?

F $(13x - 12y)(13x - 12y)$

H $(13x + 12y)(13x + 12y)$

G $(13x + 48y)(13x + 3y)$

J $(x + 6y)(169x + 24y)$

STA: (Key)4.0

15. Which product of factors is equivalent to $16x^2 - 8x + 1$?

A $(4x - 1)(4x - 1)$

C $4(x + 1)(x + 1)$

B $(8x - 1)(2x - 1)$

D $(2x + 1)(8x + 1)$

STA: (Key)4.0

16. The area a right triangle is represented by $\frac{1}{2}y^2 + 3y + 4$. Which factors could represent the base times height?

F $(y + 4)(y - 1)$

H $\left(\frac{1}{2}y + 2\right)\left(\frac{1}{2}y + 4\right)$

G $(y + 2)(y + 4)$

J $(y - 2)(3y - 2)$

STA: (Key)4.0

Algebra II 6.0

MULTIPLE CHOICE

1. What are the values of x and y that make $9x + 2 + (y - 3)i = -7 + 5i$ true?

A $x = -1, y = 8$

C $x = -4, y = \frac{1}{3}$

B $x = 1, y = 8$

D $x = \frac{7}{9}, y = 8$

STA: (Key)6.0

2. What is an equivalent form of $\frac{6}{3-i}$?

F $\frac{6}{5}$

H $\frac{9+3i}{5}$

G $\frac{9+3i}{4}$

J $\frac{2}{1-i}$

STA: (Key)6.0

3. $(7-i)(-2+3i) =$

A $-17 + 23i$

C $-11 - 23i$

B $-12i$

D $-11 + 23i$

STA: (Key)6.0

4. What is an equivalent form of $(20 - 4i) - (-16 + 3i)$?

F $36 - 7i$

H $36 - 12i$

G $4 - i$

J 29

STA: (Key)6.0

5. For $i = \sqrt{-1}$, which shows $\frac{(1-2i)^2}{2+i}$ written in the form $a + bi$?

A $2 + i$

C $-2 - i$

B $-\frac{2}{3} - \frac{5}{3}i$

D $-1 - \frac{1}{2}i$

STA: (Key)6.0

6. $(7i)(-2i)(-2i) =$

F 28

H $28i$

G $-28i$

J $3i$

STA: (Key)6.0

7. $i + i^2 + i^3 + i^4 =$

A i

C 1

B $-i$

D 0

STA: (Key)6.0

8. What is an equivalent form of $\frac{5}{5+2i}$?

F $\frac{5}{3}$

G $\frac{1}{2i}$

STA: (Key)6.0

H $\frac{25-10i}{21}$

J $\frac{25-10i}{29}$

9. $(1-2i)(1+2i)(-5+6i) =$

A $-5+6i$

B $-25+30i$

STA: (Key)6.0

C $15-18i$

D $-3+6i$

10. $(4i)(-9i)(-i)(3i) =$

F 108

G -108

STA: (Key)6.0

H $108i$

J $-108i$

11. $2+i+3+i^2-8+i^3 =$

A i

B $-3i$

STA: (Key)6.0

C -4

D -2

12. What is an equivalent form of $(2-4i) - (1+2i) - (-6-3i)$?

F $7-5i$

G $7-3i$

STA: (Key)6.0

H $-5-5i$

J -2

13. What are the values of c and d that make $8c-6-(d-2)i = -4+3i$ true?

A $c = \frac{1}{4}, d = -1$

B $c = -\frac{1}{4}, d = 1$

STA: (Key)6.0

C $c = -4, d = -1$

D $c = \frac{1}{4}, d = 1$

14. For $i = \sqrt{-1}$, which shows $\frac{(3-i)^2}{3+i}$ written in the form $a+bi$?

F $9-13i$

G $18-26i$

STA: (Key)6.0

H $\frac{9}{5} - \frac{13i}{5}$

J $\frac{9}{5} - 13i$

15. What is the product of the complex numbers $(4+i)$ and $(4-i)$?

A $16i$

B $-16i$

STA: (Key)6.0

C 15

D 17

Algebra II 7.0

MULTIPLE CHOICE

1. $\frac{x^2y - x^2}{x^5 - x^5y} =$

A $\frac{x^3 - 1}{-y}$

B $\frac{y + 1}{x^3 + x^3y}$

C $\frac{1}{x^3}$

D $-\frac{1}{x^3}$

STA: (Key)7.0

2. What is $\frac{8a^{-2}b^{-3}}{12x^{-2}y^{-3}} \div \frac{4a^{-1}b^{-4}}{3x^{-4}y^{-1}}$?

F $\frac{by^2}{2ax^2}$

G $\frac{9x^6y^4}{8a^3b^7}$

H $\frac{2by^2}{ax^2}$

J $\frac{8by^2}{9ax^2}$

STA: (Key)7.0

3. Which product is equivalent to $\frac{32 - 8y^2}{y - 2}$?

A $-4(4 + y)$

B $-8(y - 2)$

C $-8(y + 2)$

D $-8(-2 - y)$

STA: (Key)7.0

4. $\frac{x + 6}{2x + 6} - \frac{x - 3}{3x + 9} =$

F $\frac{x + 12}{6x + 18}$

G $\frac{x + 24}{6x + 18}$

H $\frac{x + 2}{x + 3}$

J $\frac{7}{18}$

STA: (Key)7.0

5. What is the simplest form of $\frac{(4a^2bc)(ab^3c)^4}{(2a^2bc)^2}$?

A $2a^2b^{11}c^3$

B $a^2b^{11}c^3$

C $a^2b^5c^2$

D $a^2b^6c^2$

STA: (Key)7.0

6. What is the simplest form of $\frac{\frac{1}{x-3}}{1 + \frac{1}{x-3}}$?

F 1

H $\frac{1}{x-4}$

G $\frac{x-4}{(x-3)^2}$

J $\frac{1}{x-2}$

STA: (Key)7.0

7. $\frac{x+5}{x+4} + \frac{2}{x^2-x-20} =$

A $\frac{x^2-23}{x^2-x-20}$

C $\frac{3}{x^2+8x+16}$

B $\frac{x+3}{x^2-x-20}$

D x^2-23

STA: (Key)7.0

8. Which product is equivalent to $\frac{2m^2-4m-6}{m-3}$?

F $-2m(m+1)$

H $2(m+1)$

G $2(m-1)$

J $2(m^2-1)$

STA: (Key)7.0

9. $\frac{6x+3}{x^2-4x+4} \cdot \frac{x^2-4}{2x^2+5x+2} =$

A $\frac{3}{x-2}$

C $\frac{3}{4x+8}$

B 3

D $\frac{3}{x+2}$

STA: (Key)7.0

10. $\frac{d^4}{(d-3)^{-2}} - \frac{d^2-9}{d^4} =$

F $\frac{d-3}{d+3}$

H $\frac{12}{d^3}$

G $\frac{6}{d^3}$

J $\frac{-6d+18}{d^4}$

STA: (Key)7.0

11. $\frac{ma+mb}{3} \div \frac{m}{6} =$

A $\frac{a+b}{2}$

C $a+b$

B $\frac{2}{a+b}$

D $2a+2b$

STA: (Key)7.0

12. What is the simplest form of $\frac{3x^3y+18x^2y^2+27xy^3}{3xy}$

F $(x-3y)^2$

H $(x+y)^2$

G $(x+3y)^2$

J $x^2+9xy+9y^2$

STA: (Key)7.0

13. What is a simplified form of $\frac{5a^3b^2c^{-3}}{(a^{-2}b^2)^{-2} \cdot \frac{b^2c^{-3}}{d^2}}$?

A $\frac{5a}{b^2}$

B $5ab^4$

C $\frac{5a}{b^4c^3}$

D $\frac{5ab}{c^3}$

STA: (Key)7.0

14. Which product is equivalent to $\frac{6x^2 - 54}{3 - x}$?

F $-6(3 - x)$

G $6(x - 3)$

STA: (Key)7.0

H $-6(x + 3)$

J $6(x + 3)$

15. $\frac{x^2 + 6x}{x + 2} \cdot \frac{x^2 - 4}{x^2 + 4x - 12} =$

A 1

B $x(x - 2)$

C x

D $\frac{x - 2}{x + 2}$

STA: (Key)7.0

16. $\frac{x + 2}{3x - 1} + \frac{-6}{3x^2 + 8x - 3} =$

F $\frac{x^2 + 5x}{3x^2 + 8x - 3}$

G $\frac{x^2 + 5x - 12}{3x^2 + 8x - 3}$

STA: (Key)7.0

H $\frac{x + 2}{x + 3}$

J $\frac{3x^2 + 7x - 3}{3x^2 + 8x - 3}$

17. $\frac{2x + 2y}{3x - 27y} \cdot \frac{7x + 7y}{x - y} \div \frac{28x^2 - 28y^2}{27y - 3x} =$

A $\frac{-1}{98(x + y)}$

B $\frac{x + y}{2}$

STA: (Key)7.0

C $\frac{-(x + y)}{2(x - y)^2}$

D $\frac{1}{x - y}$

Algebra II 8.0

MULTIPLE CHOICE

1. What amount must be added to each side of $x^2 + 12x = -9$ to solve by completing the square?

A 6
B 36
C 45
D 144

STA: (Key)8.0

2. What are the solutions to the equation $5x^2 - 20x - 25 = 0$?

F $x = 5; x = -1$
G $x = -25; x = 5$
H $x = 5; x = 1$
J $x = -5; x = -1$

STA: (Key)8.0

3. What are the solutions to the equation $m^2 = 6m - 2$?

A $m = \frac{3 + \sqrt{7}}{2}; m = \frac{3 - \sqrt{7}}{2}$
C $m = 3 + \sqrt{7}; m = 3 - \sqrt{7}$

B $m = 3 + \sqrt{11}; m = 3 - \sqrt{11}$
D no solutions

STA: (Key)8.0

4. What are the solutions to the equation $3x^2 + 144 = 0$?

F $x = \frac{i\sqrt{191}}{2}, x = \frac{-i\sqrt{191}}{2}$
H $x = 4\sqrt{3}, x = -4\sqrt{3}$

G $x = \frac{4i\sqrt{3}}{3}, x = \frac{-4i\sqrt{3}}{3}$
J $x = 4i\sqrt{3}, x = -4i\sqrt{3}$

STA: (Key)8.0

5. Lisa is thinking of three consecutive numbers. The square of the first number is 46 more than three times the sum of the other two numbers. Which is the first of Lisa's three numbers?

A 16
B 15
C 13
D 11

STA: (Key)8.0

6. Bhavata is solving the equation $x^2 - 2x = 3$. What number should he add to both sides of the equation to complete the square?

F 0
G 1
H 4
J 9

STA: (Key)8.0

7. What amount could be added to each side of $4y^2 + 12y - 5 = 0$ to solve by completing the square?

A 39
B $\frac{9}{4}$
C $\frac{3}{2}$
D $\frac{1}{2}$

STA: (Key)8.0

8. What amount could be added to each side of $2x^2 - 8x - 5 = 0$ to solve by completing the square?

F 18

H 4

G -18

J -4

STA: (Key)8.0

9. What are the solutions to the equation $\frac{1}{2x^2} + 1 = \frac{2}{x^2} - 1$?

A $x = \frac{\sqrt{3}}{2}; x = -\frac{\sqrt{3}}{2}$

C $x = \frac{\sqrt{6}}{3}; x = -\frac{\sqrt{6}}{3}$

B $x = \frac{\sqrt{2}}{3}; x = -\frac{\sqrt{2}}{3}$

D no solutions

STA: (Key)8.0

10. What are the solutions to the equation $3x^2 - 5x + 1 = 0$?

F $x = \frac{5 - \sqrt{13}}{6}, x = \frac{5 + \sqrt{13}}{6}$

H $x = \frac{9 - i\sqrt{11}}{10}, x = \frac{9 + i\sqrt{11}}{10}$

G $x = \frac{5 - \sqrt{37}}{6}, x = \frac{5 + \sqrt{37}}{6}$

J $x = \frac{5}{6} + \sqrt{13}, x = \frac{5}{6} - \sqrt{13}$

STA: (Key)8.0

11. There are two numbers with the following properties.

1) The second number is 8 more than the first number.

2) The product of the two numbers is 13 less than their sum.

Which of the following represents possible values of these two numbers?

A -5, 3

C -8, 8

B -9, 1

D 5, -3

STA: (Key)8.0

Algebra II 9.0

MULTIPLE CHOICE

1. Which of the following *most* accurately describes the translation of the graph $y = 2(x - 1)^2 - 5$ to the graph of $y = 2(x - 2)^2 - 3$?

A 2 to the right
 B up 2 and 1 to the right
 C up 2 and 1 to the left
 D up 1 and 2 to the right

STA: (Key)9.0

2. Which is the equation $8x^2 + 8x + 6 = y$ written in the standard form of the equation of a parabola?

F $y = 2(2x + 2)^2 + 6$
 G $y = 2(2x + 1)^2 + 1$
 H $y = (4x + 2)^2 + 2$
 J $y = 2(2x + 1)^2 + 4$

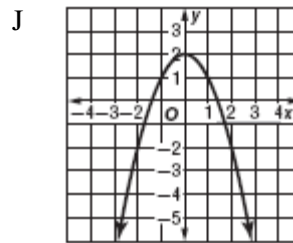
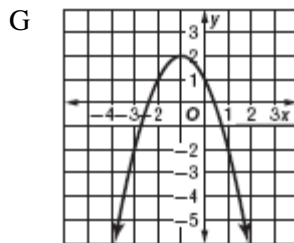
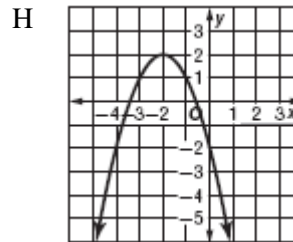
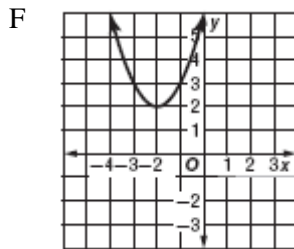
STA: (Key)9.0

3. Which of the following is true about the graphs of $y = (x - 3)^2 - 1$ and $y = (x - 1)^2 - 3$?

A The graphs have the same shape with different vertices.
 B One graph has a vertex that is a maximum, while the other graph has a vertex that is a minimum.
 C The graphs have different shapes with different vertices.
 D One graph is narrow; the other is wide.

STA: (Key)9.0

4. If the graph of the equation $y = -(x + 1)^2 + 2$ is shifted 1 unit to the left, which would be the graph of the new parabola?



STA: (Key)9.0

Algebra II 10.0

MULTIPLE CHOICE

1. What are the x -intercepts of the graph of the equation $x^2 + 3x + 2 = y$?

A $\sqrt{\frac{2}{3}}$ and $-\sqrt{\frac{2}{3}}$

C 2 and 1

B $\frac{\sqrt{2}}{3}$ and $-\frac{\sqrt{2}}{3}$

D -1 and -2

STA: (Key)10.0

2. What is the minimum value of the quadratic function $f(x) = 2(x + 3)^2 - 5$?

F (3, 5)

H (-3, 5)

G (-3, -5)

J (3, -5)

STA: (Key)10.0

3. Which ordered pair is the maximum value of $f(x) = -2x^2 + 8x + 1$?

A (2, 9)

C (-2, 8)

B (8, 1)

D (-2, 0)

STA: (Key)10.0

4. How many real zeros does the function $f(x) = x^2 - x + 2$ have?

F 0

H 2

G 1

J 3

STA: (Key)10.0

5. What value of k makes $x = -2$ the axis of symmetry for the graph of $y = x^2 + kx - 25$?

A 23

C 4

B 6

D -2

STA: (Key)10.0

6. Which *best* describes the zeros the function $f(x) = x^2 + 6x + 10$ has?

F 1 real zeros

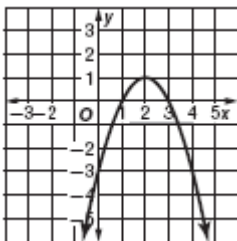
H 3 real zeros

G 2 real zeros

J 2 imaginary zeros

STA: (Key)10.0

7. Which equation is graphed on the coordinate grid shown below?



A $y = -x^2 - 2x + 1$

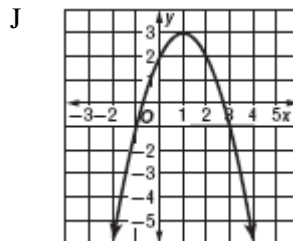
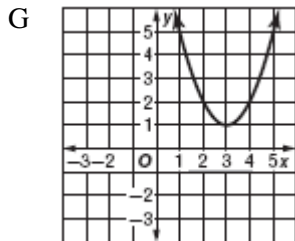
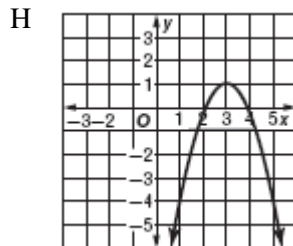
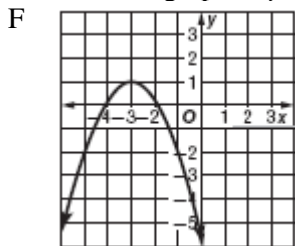
C $y = x^2 - 4x + 3$

B $y = -x^2 + 4x - 3$

D $y = x^2 + 2x + 1$

STA: (Key)10.0

8. Which is the graph of $y = -2(x - 3)^2 + 1$?



STA: (Key)10.0

9. What are the x -intercepts of the graph of the equation $2x^2 - 4x + 1 = y$?

A $\frac{2 + \sqrt{2}}{2}$ and $\frac{2 - \sqrt{2}}{2}$

C $1 + 2\sqrt{2}$ and $1 - 2\sqrt{2}$

B $\frac{2 + \sqrt{6}}{2}$ and $\frac{2 - \sqrt{6}}{2}$

D $-1 + 2\sqrt{2}$ and $-1 - 2\sqrt{2}$

STA: (Key)10.0

10. What is the maximum value of the quadratic function $f(x) = -2x^2 + 8x - 4$?

F $(6, -28)$

H $(3, 38)$

G $(-8, -128)$

J $(2, 4)$

STA: (Key)10.0

11. Which ordered pair is the vertex of $f(x) = x^2 - 8x + 15$?

A $\frac{-1 + \sqrt{61}}{2}, \frac{-1 - \sqrt{61}}{2}$

C $(0, 15)$

B $(4, -1)$

D $\frac{-1 + i\sqrt{61}}{2}, \frac{-1 - i\sqrt{61}}{2}$

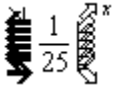
STA: (Key)10.0

Algebra II 11.1

MULTIPLE CHOICE

1. What are the solutions to the equation $\log_3(x^2 + 2) = \log_3(3x)$?
- A $x = \frac{\log_3 2}{\log_3 3}, x = -\frac{\log_3 2}{\log_3 3}$ C $x = 2, x = 1$
- B $x = \frac{\log_3 3}{\log_3 2}, x = -\frac{\log_3 3}{\log_3 2}$ D $x = -2, x = -1$

STA: (Key)11.1

2. Which equation is equivalent to $\log_5 \frac{1}{25} = x$?
- F  $\frac{1}{25} = 5$ H $5^{\frac{1}{25}} = x$
- G $5^x = \frac{1}{25}$ J $5 = 25x$

STA: (Key)11.1

3. What is the solution to the equation $\log_x 16 = 2$?
- A $x = 2$ C $x = 4$
- B $x = 8$ D no solution

STA: (Key)11.1

4. Which expression is equivalent to $\log_4 36$?
- F $\frac{\log_{10} 36}{\log_{10} 4}$ H $\frac{\log_{10} 9}{\log_{10} 4}$
- G $\frac{\log_{10} 4}{\log_{10} 36}$ J $\frac{\log_{10} 4}{\log_{10} 9}$

STA: (Key)11.1

5. If $2^{5x-8} = 16^x$, what is the value of x ?
- A $x = \frac{1}{2}$ C $x = 2$
- B $x = \frac{1}{8}$ D $x = 8$

STA: (Key)11.1

6. If $\log_{10} x = 5$, what is the value of x ?
- F $x = \frac{1}{100,000}$ H $x = 50$
- G $x = \frac{1}{50}$ J $x = 100,000$

STA: (Key)11.1

7. Which expression is equivalent to $\log_5 \frac{3x}{2y}$?

A $\log_5 3x - \log_5 2y$

B $\log_5 3x + \log_5 2y$

STA: (Key)11.1

C $(\log_5 3x)(\log_5 2y)$

D $\log_5(6xy)$

8. Which equation is equivalent to $\log_3 243 = x$?

F $3^x = \frac{1}{243}$

G $\frac{1}{243} = 3^x$

STA: (Key)11.1

H $3 = 243x$

J $3^x = 243$

9. What are the solutions to the equation $x^{\frac{2}{3}} = 4$?

A $x = \frac{2}{3}, x = -\frac{2}{3}$

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

STA: (Key)11.1

C $x = \frac{1}{8}, x = -\frac{1}{8}$

D $x = \frac{1}{64}, x = -\frac{1}{64}$

10. What is the solution to the equation $10\log_5 x - 4\log_5 25 = \log_5 25$?

F $x = \frac{\log_5 25}{\log_5 10}$

G $x = 30$

STA: (Key)11.1

H $x = 5$

J $x = \frac{1}{5}$

11. If $6^{3x+1} = 36^x$, what is the value of x ?

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

B $x = -1$

STA: (Key)11.1

C $x = \frac{1}{2}$

D $x = \frac{1}{6}$

12. If $\log_{10} x = -4$, what is the value of x ?

F $x = -10,000$

G $x = -40$

STA: (Key)11.1

H $x = 10,000$

J $x = \frac{1}{10,000}$

Algebra II 11.2

MULTIPLE CHOICE

1. Lourdes, Dylan, Rauf, and Hong each went to the chalk board to show how they evaluated an expression. Each student's work is shown below. Only one of them arrived at the correct conclusion using correct steps.

Lourdes' work

$$\begin{aligned} 81^{\frac{3}{4}} &= (3^4)^{\frac{3}{4}} \\ &= 3^3 \\ &= 27 \end{aligned}$$

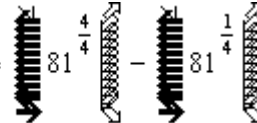
Dylan's work

$$\begin{aligned} 81^{\frac{3}{4}} &= \frac{4}{3}(81) \\ &= 4(27) \\ &= 108 \end{aligned}$$

Rauf's work

$$\begin{aligned} 81^{\frac{3}{4}} &= (3^{12})^{\frac{3}{4}} \\ &= 3^9 \\ &= 27 \end{aligned}$$

Hong's work

$$\begin{aligned} 81^{\frac{3}{4}} &= \sqrt[4]{81^3} - \sqrt[4]{81} \\ &= 81 - \sqrt[4]{81} \\ &= 81 - \sqrt[4]{3 \cdot 3 \cdot 3 \cdot 3} \\ &= 78 \end{aligned}$$


Which student arrived at the correct conclusion using correct steps?

- A Lourdes
B Dylan
C Rauf
D Hong

STA: (Key)11.2

2. Which is the first incorrect step in simplifying $2\log_4 10 - 3\log_4 2 + \log_4 2$?

$$\begin{aligned} &2\log_4 10 - 3\log_4 2 + \log_4 2 \\ \text{Step 1:} &= 2\log_4 10 - 2\log_4 2 \\ \text{Step 2:} &= \log_4 20 - \log_4 4 \\ \text{Step 3:} &= \log_4 16 \\ \text{Step 4:} &= 2 \end{aligned}$$

- F Step 1
G Step 2
H Step 3
J Step 4

STA: (Key)11.2

3. Which is the first incorrect step in simplifying $\sqrt[4]{16} + \sqrt[3]{2}$?

$$\begin{aligned} &\sqrt[4]{16} + \sqrt[3]{2} \\ \text{Step 1:} &= \sqrt[4]{2^4} + \sqrt[3]{2^1} \\ \text{Step 2:} &= 2 \div 2^{\frac{1}{3}} \\ \text{Step 3:} &= 2 \\ \text{Step 4:} &= 2^3 \end{aligned}$$

- A Step 1
B Step 2
C Step 3
D Step 4

STA: (Key)11.2

Algebra II 12.0

MULTIPLE CHOICE

1. If the equation $y = 3^x$ is graphed, which of the following values of x would produce a point closest to the x -axis?

A 3
B 2
C 0
D -3

STA: (Key)12.0

2. Bacteria in a culture are growing exponentially with time, as shown in the table below.

Bacteria Growth	
Day	Number of Bacteria
0	10,000
1	20,000
2	40,000

Which of the following equations expresses the number of bacteria, y , present at any time, t ?

F $y = (10,000) \cdot 2^t$
G $y = (10,000) \cdot 2t$
H $y = 2000^{t+1}$
J $y = 200(t + 1)$

STA: (Key)12.0

3. If the equation $y = \left(\frac{1}{3}\right)^x$ is graphed, which of the following values of x would produce a point closest to the x -axis?

A 3
B 2
C 0
D -3

STA: (Key)12.0

4. A certain radioactive element decays over time according to the equation

$y = A \left(\frac{1}{2}\right)^{\frac{t}{400}}$, where A = the number of grams present initially and t = time in years. If 5000 grams

were present initially, how many grams will remain after 1200 years?

F 4204 grams
G 625 grams
H 50 grams
J 25 grams

STA: (Key)12.0

5. If the equation $y = 3^{-x}$ is graphed, which of the following values of x would produce a point closest to the x -axis?

A 3
B 2
C 0
D -3

STA: (Key)12.0

6. $x^{\frac{3}{2}}$ =

F $\sqrt[2]{3^x}$

G $\sqrt[3]{x^2}$

H $\sqrt[2]{x^3}$

J $\sqrt[2]{\frac{x}{3}}$

STA: (Key)12.0

7. Which equation represents exponential decay?

A $y = 23^x$

B $y = 2\left(\frac{4}{3}\right)^x$

C $y = 8(1.3)^x$

D $y = \frac{1}{5}\left(\frac{1}{5}\right)^x$

STA: (Key)12.0

8. Which equation, when graphed, passes through $\left(-1, \frac{4}{3}\right)$ and $(0, 1)$?

F $y = -\left(\frac{3}{4}\right)^x$

G $y = \left(\frac{3}{4}\right)^x$

H $y = 4\left(\frac{1}{3}\right)^x$

J $y = \frac{1}{3}(4)^x$

STA: (Key)12.0

9. Which pair of points does the graph of $y = 2\left(\frac{1}{3}\right)^x$ pass through?

A $\left(0, \frac{2}{3}\right)$ and $(-1, 6)$

B $(0, 2)$ and $\left(1, \frac{2}{3}\right)$

C $(0, 6)$ and $\left(1, \frac{2}{3}\right)$

D $\left(0, \frac{2}{3}\right)$ and $\left(1, -\frac{2}{3}\right)$

STA: (Key)12.0

10. A sum of money is invested and increases over time according to the equation $A = p\left(1 + \frac{r}{k}\right)^{kn}$,

where p = the number of dollars invested at an annual interest rate r , expressed as a decimal, compounded k times a year for n years results in the total amount A . If \$2000 are invested at 12% annual interest and are compounded semi-annually, what amount will there be in 2 years?

F about \$2120

H about \$2247

G about \$2240

J about \$2525

STA: (Key)12.0

Algebra II 13.0

MULTIPLE CHOICE

1. $\log_6 42 =$

A $\frac{\log_{10} 42}{\log_{10} 6}$

C $\frac{\log_{10} 6}{\log_{10} 42}$

B $(\log_{10} 6)(\log_{10} 7)$

D $(\log_{10} 40) + (\log_{10} 2)$

STA: 13.0

2. $\frac{\log_{10} 24}{\log_{10} 3} =$

F $\log_{10} \frac{24}{3}$

H $\log_3 8$

G $\log_{24} 3$

J $\log_3 24$

STA: 13.0

3. What are the values of x and y in the equation shown below?

$$\log_8 14 = \frac{\log_{10} x}{\log_{10} y}$$

A $x = 2; y = 7$

C $x = 14; y = 8$

B $x = 7; y = 2$

D $x = 8; y = 14$

STA: 13.0

4. What is the value of x in the equation shown below?

$$4^x = 12$$

F $x = \frac{\log_{10} 12}{\log_{10} 4}$

H $x = (\log_{10} 3)(\log_{10} 4)$

G $x = \frac{\log_{10} 4}{\log_{10} 12}$

J $x = (\log_{10} 12) - (\log_{10} 4)$

STA: 13.0

5. $\log_4 \frac{3}{2} =$

A $\frac{\log_{10} 3}{\log_{10} 2}$

C $(\log_4 3) + (\log_4 2)$

B $(\log_4 3) - (\log_4 2)$

D $\frac{\log_{10} 4}{\log_{10} \frac{3}{2}}$

STA: 13.0

6. What are the values of x and y in the equation shown below?

$$\log_{xy} = \frac{\log_{10} 9}{\log_{10} 2}$$

F $x = 9; y = 2$

H $x = 10; y = 18$

G $x = 2; y = 9$

J $x = 18; y = 10$

ANS: G

PTS: 1

STA: 13.0

Algebra II 15.0

MULTIPLE CHOICE

1. Which equation is true for all real numbers?

A $\log_5 x - \log_5 y = \log_5 \frac{x}{y}$

C $\sqrt[4]{(x)^4} = x$

B $\frac{1}{(x+y)}(x+y) = 1$

D $x^{12} \cdot x^{\frac{1}{4}} = x^3$

STA: (Key)15.0

2. For real numbers m and n , when is the equation $|m - n| = |n - m|$?

F Only when $m = n$.

H Only when both $m = 0$ and $n = 0$.

G When $m = 0$ or $n = 0$.

J They are always equal.

STA: (Key)15.0

3. If x is a real number, which *best* describes the values of x for which the inequality $\sqrt{-x} > 1$ is true?

A all $-1 > x > 1$

C all values of x

B all $x < -1$

D no values of x

STA: (Key)15.0

4. For which values of x is the equation $\sqrt{(x^2 - 16)^2} = 0$ true?

F for all real numbers x

H for some real numbers x

G for no real numbers x

J impossible to determine

STA: (Key)15.0

5. If x is a real number, for what values of x is the equation $\sqrt[3]{\frac{1}{x^3}} = \frac{1}{x}$ true?

A for some values of x

C for all values of x

B for no values of x

D impossible to determine

STA: (Key)15.0

6. For which values of x is the equation $\frac{(x-4)^2}{x-4} = x-4$ true?

F for all real numbers x

H for no real numbers x

G for some real numbers x

J impossible to determine

STA: (Key)15.0

7. Which equation is true for all real numbers?

A $\log_{10} x \div \log_{10} y = \log_y x$

C $x^{\frac{1}{3}} \cdot x^2 = x$

B $\frac{1}{(xy)}(xy) = 1$

D $\sqrt{x^4} = x^2$

STA: (Key)15.0

Algebra II 16.0

MULTIPLE CHOICE

1. What are the coordinates of the foci of the graph of the equation $4x^2 + 16y^2 = 16$?

A $(0, \sqrt{3}), (0, -\sqrt{3})$ C $(0, 3), (0, -3)$
 B $(\sqrt{3}, 0), (-\sqrt{3}, 0)$ D $(3, 0), (-3, 0)$

STA: 16.0

2. The graph of $\frac{x^2}{16} - \frac{y^2}{25} = 1$ is a hyperbola. Which set of equations represents the asymptotes of the hyperbola's graph?

F $y = \frac{5}{4}x, y = -\frac{5}{4}x$ H $y = \frac{25}{16}x, y = -\frac{25}{16}x$
 G $y = \frac{5}{4}x, y = -\frac{4}{5}x$ J $y = \frac{16}{25}x, y = -\frac{16}{25}x$

STA: 16.0

3. What are the coordinates of the center of the graph of the equation $3x^2 + 3y^2 = 9$?

A $(3, 3)$ C $(0, 0)$
 B $(0, 3)$ D $(3, 0)$

STA: 16.0

4. The graph of $\frac{x^2}{36} + \frac{y^2}{49} = 1$ is an ellipse. Which set of equations represents the foci of the ellipse's graph?

F $(0, \frac{6}{7}), (0, -\frac{6}{7})$ H $(0, \frac{\sqrt{3}}{7}), (0, -\frac{\sqrt{3}}{7})$
 G $(0, \sqrt{13}), (0, -\sqrt{13})$ J $(0, 1), (0, -1)$

STA: 16.0

5. The graph of $y = \frac{1}{6}(x + 2)^2$ is a parabola. Which equation represents the directrix of the parabola's graph?

A $y = -\frac{3}{2}$ C $y = \frac{1}{6}$
 B $y = -\frac{2}{3}$ D $y = \frac{1}{3}x$

STA: 16.0

Algebra II 17.0

MULTIPLE CHOICE

1. $x^2 + y^2 - 6x - 12y = -20$

What is the standard form of the equation of the conic given above?

A $(x - 3)^2 - (y - 6)^2 = 25$

C $\frac{(x - 6)^2}{25} + \frac{(y - 3)^2}{25} = 1$

B $\frac{(x - 6)^2}{25} - \frac{(y - 3)^2}{25} = 1$

D $(x - 3)^2 + (y - 6)^2 = 25$

STA: 17.0

2. Which *best* describes the graph of the equation $16x^2 + 9y^2 = 144$?

F circle

H hyperbola

G ellipse

J parabola

STA: 17.0

3. Which *best* describes the graph of the equation $16x^2 - 9y^2 = 144$?

A circles

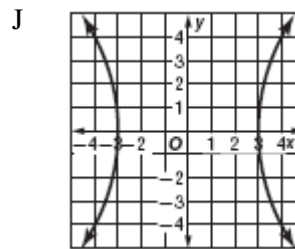
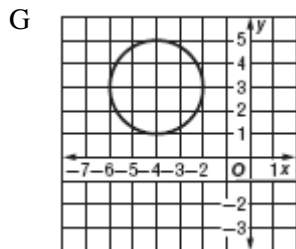
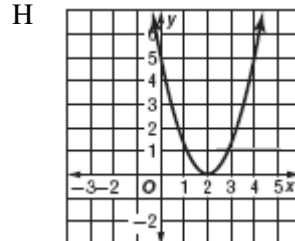
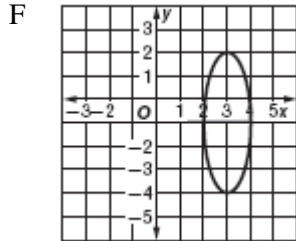
C hyperbola

B ellipse

D parabola

STA: 17.0

4. Which is the graph of $3x^2 - y^2 = 12$?



STA: 17.0

5. $-36x^2 + 4y^2 + 72x - 40y = -28$

What is the standard form of the equation of the conic given above?

A $\frac{(x-1)^2}{9} + \frac{(y-5)^2}{1} = 1$

C $\frac{(y-5)^2}{9} + \frac{(x-1)^2}{1} = 1$

B $\frac{(y-5)^2}{9} - \frac{(x-1)^2}{1} = 1$

D $\frac{(x-1)^2}{9} - \frac{(y-5)^2}{1} = 1$

STA: 17.0

6. Which *best* describes the graph of the equation $\frac{(x-3)^2}{16} - \frac{(y-8)^2}{9} = 1$?

- F circle
G ellipse

- H hyperbola
J parabola

STA: 17.0

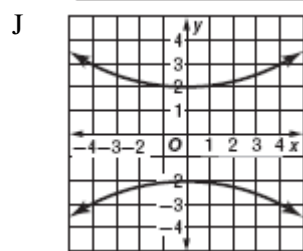
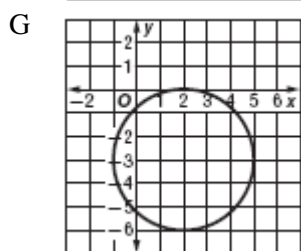
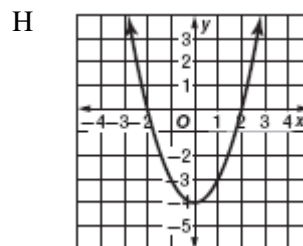
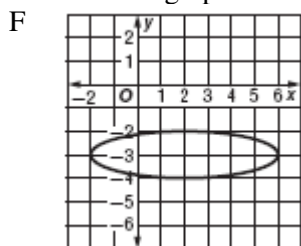
7. Which *best* describes the graph of the equation $\frac{(x-5)^2}{169} + \frac{(y-2)^2}{144} = 1$?

- A circle
B ellipse

- C hyperbola
D parabola

STA: 17.0

8. Which is the graph of $x^2 + y^2 - 4x + 6y = -4$?



STA: 17.0

Algebra II 18.0

MULTIPLE CHOICE

1. A train is made up of a locomotive, 5 different cars, and a caboose. If the locomotive must be first and the caboose must be last, how many different ways can the train be ordered?

A 120
B 122
C 2520
D 5040

STA: (Key)18.0

2. From a list of 12 books, each student must choose 3 books for book reports. The first report is a traditional book report; the second is a poster, and the third is a diorama. How many different ordering of books can be chosen?

F 79,833,600
G 15,840
H 2640
J 1320

STA: (Key)18.0

3. How many ways can three greetings cards be arranged in a row on a tabletop if chosen from a selection of 8 different cards?

A 6720
B 336
C 56
D 24

STA: (Key)18.0

4. Joaquin wants to create several different 7-character passwords. He wants to use arrangements of the first 5 letters of his name (joaqu) *followed* by arrangements of the 2 digits in 18, his age. How many different passwords can he create in this way?

F 240
G 70
H 35
J 7

STA: (Key)18.0

5. Donald is one of 9 finalists in a spelling bee. One of the finalists will be awarded a gold medal and four will be awarded honorable mention medals. How many ways can the medals be awarded?

A 45
B 630
C 3024
D 15,120

STA: (Key)18.0

6. Mindy has a collection of 6 CDs. She wants to bring 2 of them on a road trip. How many possible choices does she have?

F 15
G 24
H 30
J 360

STA: (Key)18.0

Algebra II 19.0

MULTIPLE CHOICE

1. Sadiki and David are among 5 students who have a chance to win a free airline ticket to San Diego. Two students from the group will be selected at random to each win a ticket. What is the possibility that the 2 students selected will be Sadiki and David?

A $\frac{2}{5}$

C $\frac{1}{5}$

B $\frac{2}{7}$

D $\frac{1}{10}$

STA: (Key)19.0

2. How many different ways can the letters of the word *MISSION* be arranged?

F 630

H 2520

G 1260

J 5040

STA: (Key)19.0

3. How many different ways can the letters in *EEL RIVER* be arranged?

A 40,320

C 3360

B 20,160

D 336

STA: (Key)19.0

4. Xing chooses five letters for a game he is playing. He randomly places the letters in a line on the board. What is the probability that he arranges the five letters in one of the following ways?

C	A	D	E	B
C	E	A	B	D
C	B	A	D	E

F $\frac{1}{40}$

H $\frac{1}{3}$

G $\frac{1}{20}$

J $\frac{3}{5}$

STA: (Key)19.0

5. Brenda has 5 male kittens and 3 female kittens. If she picks up 2 kittens to give to a friend, what is the probability that she will pick up 1 male and 1 female kitten?

A $\frac{17}{28}$

C $\frac{2}{7}$

B $\frac{15}{28}$

D $\frac{1}{8}$

STA: (Key)19.0

Algebra II 20.0

MULTIPLE CHOICE

1. $(x - y)^6 =$

- A $x^6 - 6x^5 + 15x^4 - 20x^3 + 15x^2 - 6x + y^6$
B $x^6 - 6x^5y + 30x^4y^2 - 120x^3y^3 + 30x^2y^4 - 6xy^5 + y^6$
C $x^6 - 6x^5y + 15x^4y^2 - 20x^3y^3 + 15x^2y^4 - 6xy^5 + y^6$
D $x^5 - 6x^4y + 15x^3y^2 - 20x^2y^3 + 15xy^4 + y^5$

STA: (Key)20.0

2. Which shows the formula for the Binomial Theorem being used to expand $(2x - 3)^8$?

F
$$\sum_{k=0}^8 \frac{8!}{k!(8-k)!} (2x)^{8-k} (-3)^k$$

H
$$\sum_{k=0}^8 \frac{8!}{(8-k)!} (2x)^{8-k} (-3)^k$$

G
$$\sum_{k=0}^3 \frac{3!}{(3-k)!} (2x^{3-k})(8)^k$$

J
$$\sum_{k=0}^8 \frac{8!}{k!(8-k)!} (2x)^{8-k} (3)^k$$

STA: (Key)20.0

3. What is the sixth term in the binomial expansion of $(3x - 2y)^5$?

- A $240xy^4$
B $-32y^5$
C $1080x^3y^2$
D There are only five terms.

STA: (Key)20.0

4. What is the third term in the binomial expansion of $(a + 3)^6$?

- F $45a^4$
G $45a^3$
H $15a^4$
J $135a^4$

STA: (Key)20.0

5. How many terms does the binomial expansion of $(6x - 9y)^{13}$ contain?

- A 12
B 13
C 14
D 26

STA: (Key)20.0

6. $(3x - 0.5y)^3 =$

- F $27x^3 - 13.5x^2y + 2.25xy^2 - 0.125y^3 + 9x^2 + 3x$
G $27x^3 - 13.5x^2y + 2.25xy^2 - 0.125y^3 + 0.25y^2 - 0.5y$
H $27x^3 - 13.5x^2y + 2.25xy^2 - 0.125y^3$
J $27x^3 - 1.5x^2y + 0.75xy^2 - 0.5y^3$

STA: (Key)20.0

Algebra II 24.0 and 25.0

MULTIPLE CHOICE

1. If $f(x) = 6x^2 - 2x + 7$ and $g(x) = x^3 - 5x^2$, what is $f(x) - g(x)$?
- A $-x^3 + x^2 - 2x + 7$ C $-x^3 + 11x^2 - 2x + 7$
B $x^3 + 11x^2 - 2x + 7$ D $-x^3 + 11x^2 + 2x - 7$

STA: 24.0 | 25.0

2. Which function is the inverse of $f(x) = \frac{2}{3}x - 1$?
- F $f^{-1}(x) = \frac{3}{2}x + \frac{3}{2}$ H $f^{-1}(x) = 2x - 3$
G $f^{-1}(x) = -\frac{2}{3}x + 1$ J $f^{-1}(x) = 3x - 2$

STA: 24.0 | 25.0

3. If $f(x) = 8x^2 + 12x - 5$ and $g(x) = 3x^2 - 7x - 9$, what is $f(x) + g(x)$?
- A $5x^2 + 19x + 4$ C $5x^2 + 19x + 4$
B $11x^2 - 19x + 14$ D $11x^2 + 5x - 14$

STA: 24.0 | 25.0

4. If $f(x) = 5x - 8$ and $h(x) = 3x^2$, what is $f(-2) \div h(3)$?
- F $-\frac{3}{4}$ H $\frac{3}{10}$
G $-\frac{2}{3}$ J $\frac{7}{12}$

STA: 24.0 | 25.0

5. Which expression represents $f(g(x))$ if $f(x) = 2x + 7$ and $g(x) = 3x - 2$?
- A $6x + 3$ C $6x^2 - 17x - 14$
B $6x + 19$ D $6x + 7$

STA: 24.0 | 25.0

6. Which expression represents $f(x) \cdot g(x) + f(x)$ if $f(x) = x + 3$ and $g(x) = x - 5$?
- F $2x^2 + 4x - 6$ H $x^2 - x - 12$
G $x^2 - 2x - 15$ J $3x + 1$

STA: 24.0 | 25.0

Probability and Statistics 2.0

MULTIPLE CHOICE

1. A box contains 9 large red marbles, 2 large yellow marbles, 6 small red marbles, and 5 small yellow marbles. If a marble is drawn at random, what is the probability that it is red, given that it is one of the large marbles?

A $\frac{3}{4}$

C $\frac{9}{15}$

B $\frac{15}{22}$

D $\frac{9}{11}$

STA: PS 2.0

2. Four cards are drawn from a standard deck of cards without replacement. What is the approximate probability of drawing a diamond, a club, a spade, and a heart in that order?

F 0.4%

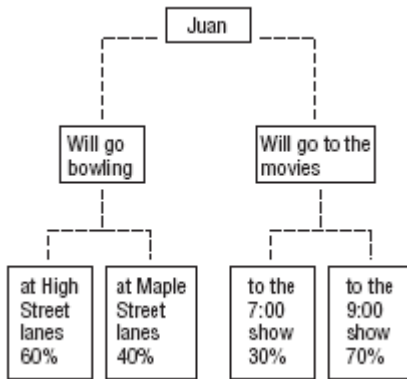
H 8%

G 4%

J 40%

STA: PS 2.0

3. The probabilities of what Juan will do tonight are shown in the chart below.



Juan will definitely either go bowling or go to the movies, but not both. The probability that Juan will go bowling and have it be at the Maple Street lanes is 12%. What is the probability that Juan will go to the movies?

A 78%

C 49%

B 70%

D 30%

STA: PS 2.0

Probability and Statistics 7.0

MULTIPLE CHOICE

1. Andrew runs a different number of miles each day. The following list shows the number of miles he has run in the past 6 days.

4, 3, 7, 7, 5, 5

If the mean of these data is approximately 5, what is the standard deviation for these data? (Round the answer to the nearest tenth.)

- A 2.2
B 1.8
C 1.5
D 0.5

STA: PS 7.0

2. To the nearest tenth, what is the standard deviation of the following temperatures?

18° 17° 30° 15°

- F 34.5°
G 20°
H 10.2°
J 5.9°

STA: PS 7.0

3. To the nearest tenth, what is the standard deviation of the following depths in feet?

7 8 1 6 9 5

- A 0.6 ft
B 2.6 ft
C 6 ft
D 6.7 ft

STA: PS 7.0

4. 4, 1, 1, 2, 2, 2, 2, 2

Danika found the mean and standard deviation of the set of numbers given above. If she adds 3 to each number, which of the following will result?

- F The mean will be multiplied by 3.
G The standard deviation will increase by 3.
H The mean will increase by 3.
J The standard deviation will be multiplied by 3.

STA: PS 7.0

5. 2, 4, 3, 1, 5

Dino found the mean and standard deviation of the set of numbers given above. If he multiplies each number by 2, which of the following will result?

- A The standard deviation will increase by 2.
B The standard deviation will be multiplied by 2.
C The mean will increase by 2.
D The mean will be multiplied by 2.

STA: PS 7.0

6. To the nearest tenth, what is the standard deviation of the following ages in years?

4 6 9 10 12 13

- F 3.2 years
G 6 years
H 6.4 years
J 10 years

ANS: F PTS: 1 STA: PS 7.0