Name: **Partners:** **Math Academy I**

Date: **Review 1 Version A**

[A] Circle whether each statement is true or false.

T F 1. $5b^{-1} = \frac{1}{5b}$

T F 2. $2\pi - 1$ is irrational.

T F 3. 1.345346 is rational.

T F 4. All irrational numbers are real.

T F 5. $14x^3 + 4x^2 + 3x^6$ is a cubic trinomial.

T F 6. There is never a remainder when a number is divided by one of its factors.

T F 7. There is never a remainder when a polynomial is divided by one of its factors.

T F 8. For any values of a, b, c, and d, $ax^3 + bx^2 + cx + d$ has three or fewer linear factors.

T F 9. The value of $f(x) = -2x^9 - 6x^6 + 4$ approaches negative infinity as x approaches infinity.

T F 10. The shapes of the graphs of $f(x) = 8x^5 + 9x^4 - 2x$ and $g(x) = -x^8 + 5x^5 - 16$ are fairly similar.

[B] State the degree of the following polynomials, given *Q* is quadratic and *C* is cubic.

1. $Q + C$ 2. $Q - C$ 3. QC 4. $C \div C$

5. $2C + Q$ 6. Q^3 7. Q^0 8. $(CQ^2)^5$

[C] Simplify completely. Do not use negative exponents in your answers.

1. $(2x - 5)^2 + x^{-1}$

2. $5x^4 (x - 2) - 2x^2 (6x^3 - 4)$

3. $2x (x + 5) (x^2 + 2x - 10)$

4. $\dfrac{(a^3b^2)^2}{(2a^4)^5 (4a^{12}b^{-2})^{-2}}$

[D] Factor completely.

1. $x^3 + 10x^2 + 21x$

2. $5x^2 + 8x + 3$

3. $8x^3 + y^6$

4. $6x^3 + 15x^2 + 4x + 10$

[E] Let $f(x) = x^4 + 2x^3 - 9x^2 - 2x + 8$.

1. Divide $f(x)$ by $(x^2 + 5x + 4)$.

2. Factor $f(x)$.

[F] Do the following to organize your group's reviews.

1. Make sure your name and your partners' names are at the top of your review the first day.
2. Staple the reviews in order, all facing the same way. Put the staple in the very top left corner if everyone is finished or if the review is due; otherwise put the staple in the top right corner.

Name: **Math Academy I**

Date: **Review 1 Version B**

[A] Circle whether each statement is true or false.

T F 1. $5b^{-1} = \frac{1}{5b}$

T F 2. $2\pi - 1$ is irrational.

T F 3. 1.345346 is rational.

T F 4. All irrational numbers are real.

T F 5. $14x^3 + 4x^2 + 3x^6$ is a cubic trinomial.

T F 6. There is never a remainder when a number is divided by one of its factors.

T F 7. There is never a remainder when a polynomial is divided by one of its factors.

T F 8. For any values of a, b, c, and d, $ax^3 + bx^2 + cx + d$ has three or fewer linear factors.

T F 9. The value of $f(x) = -2x^9 - 6x^6 + 4$ approaches negative infinity as x approaches infinity.

T F 10. The shapes of the graphs of $f(x) = 8x^5 + 9x^4 - 2x$ and $g(x) = -x^8 + 5x^5 - 16$ are fairly similar.

[B] State the degree of the following polynomials, given *Q* is quadratic and *C* is cubic.

1. $Q + C$ 2. $Q - C$ 3. QC 4. $C \div C$

5. $2C + Q$ 6. Q^3 7. Q^0 8. $(CQ^2)^5$

[C] Simplify completely. Do not use negative exponents in your answers.

1. $(3x - 5)^2 + 8x^{-1}$

2. $5x^4 (x^2 - 9) - 2x (8x^5 - 6x^3 - 4)$

3. $4x^3 (x + 5) (x^2 + 2x - 10)$

4. $\dfrac{(a^4b^2c^{-11})^2}{(2a^4)^5 (6a^{12}b^{-8}c^{20})^{-2}}$

[D] Factor completely.

1. $3x^3 + 30x^2 + 63x$

2. $3x^2 + 14x + 8$

3. $16x^3y^3 + 2y^9$

4. $2x^{11} + 5x^9 - 4x^8 - 10x^6$

[E] Let $f(x) = x^4 + 3x^3 - 14x^2 - 12x + 40$.

1. Divide $f(x)$ by $(x^2 + 7x + 10)$.

2. Factor $f(x)$.

[F] Bonus. If $f(c) = 0$, then $x - c$ is a factor of $f(x)$.

1. Based on this, use a graphing calculator to factor $x^3 - 13x^2 + 50x - 56$.
2. Check your answer by multiplying the factors together.

Name: **Math Academy I**

Date: **Review 1 Version C**

[A] Circle whether each statement is true or false.

T F 1. $5b^{-1} = \frac{1}{5b}$

T F 2. $2\pi - 1$ is irrational.

T F 3. 1.345346 is rational.

T F 4. All irrational numbers are real.

T F 5. $14x^3 + 4x^2 + 3x^6$ is a cubic trinomial.

T F 6. There is never a remainder when a number is divided by one of its factors.

T F 7. There is never a remainder when a polynomial is divided by one of its factors.

T F 8. For any values of a, b, c, and d, $ax^3 + bx^2 + cx + d$ has three or fewer linear factors.

T F 9. The value of $f(x) = -2x^9 - 6x^6 + 4$ approaches negative infinity as x approaches infinity.

T F 10. The shapes of the graphs of $f(x) = 8x^5 + 9x^4 - 2x$ and $g(x) = -x^8 + 5x^5 - 16$ are fairly similar.

[B] State the degree of the following polynomials, given *Q* is quadratic and *C* is cubic.

1. $Q + C$ 2. $Q - C$ 3. QC 4. $C \div C$

5. $2C + Q$ 6. Q^3 7. Q^0 8. $(CQ^2)^5$

[C] Simplify completely. Do not use negative exponents in your answers.

1. $-(3x - 5)^2 + 8x^{-1}$

2. $5x^7 (3x - 2) - 2x^2 (6x^6 - x^5 - 4.5)$

3. $2x (4x^3) (x + 5) (x^2 + 2x - 10)$

4. $\dfrac{24(a^3b^2c^{-11})^8}{(2a^4)^5 (3a^{12}b^{-8}c^{20})^{-2}}$

[D] Factor completely.

1. $4x^5 + 12x^4 + 8x^3$

2. $18x^2 + 53x + 20$

3. $18x^{27}y^3 + 144y^9$

4. $21x^4 - 56x^3 + 9x^2 - 24x$

[E] Let $f(x) = x^4 + 2x^3 - 9x^2 - 2x + 8$.

1. Divide $f(x)$ by $(x^2 - 3x + 2)$.

2. Factor $f(x)$.

[F] Bonus. If $f(c) = 0$, then $x - c$ is a factor of $f(x)$.

1. Based on this, use a graphing calculator to factor $x^4 - 8x^3 - 34x^2 + 200x + 225$.
2. Check your answer by multiplying the factors together.

Name: **Math Academy I**

Date: **Review 1 Version D**

[A] Circle whether each statement is true or false.

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T F 2. $2\pi - 1$ is irrational.

T F 3. 1.345346 is rational.

T F 4. All irrational numbers are real.

T F 5. $14x^3 + 4x^2 + 3x^6$ is a cubic trinomial.

T F 6. There is never a remainder when a number is divided by one of its factors.

T F 7. There is never a remainder when a polynomial is divided by one of its factors.

T F 8. For any values of a, b, c, and d, $ax^3 + bx^2 + cx + d$ has three or fewer linear factors.

T F 9. The value of $f(x) = -2x^9 - 6x^6 + 4$ approaches negative infinity as x approaches infinity.

T F 10. The shapes of the graphs of $f(x) = 8x^5 + 9x^4 - 2x$ and $g(x) = -x^8 + 5x^5 - 16$ are fairly similar.

[B] State the degree of the following polynomials, given *Q* is quadratic and *C* is cubic.

1. $Q + C$	2. $Q - C$	3. QC	4. $C \div C$
5. $2C + Q$	6. Q^3	7. Q^0	8. $(CQ^2)^5$

[C] Simplify completely. Do not use negative exponents in your answers.

1. $-(2x - 5)^2 + \frac{1}{2}x^{-1}$

2. $1.5x^4(8x^3 - 3) - 2x^2(-2x^5 + 3x^4 + 12x^2)$

3. $2x(4x^3)(x - 5)(x^2 + 2x - 10)$

4. $\dfrac{-24(a^4b^2c^{-15})^8}{(-2a^4)^5(-3a^{12}b^{-8}c^{20})^{-2}}$

[D] Factor completely.

1. $4x^5 + 22x^4 + 10x^3$

2. $48x^2 + 148x + 90$

3. $48x^{63}y^{11} - 6x^{15}y^{29}z^3$

4. $12x^4 + 24x^3 + 6x + 12$

[E] Let $f(x) = x^4 + 3x^3 - 14x^2 - 12x + 40$.

1. Divide $f(x)$ by $(x^2 - 4x + 4)$.

2. Factor $f(x)$.

[F] Bonus. If $f(c) = 0$, then $x - c$ is a factor of $f(x)$.

1. Based on this, use a graphing calculator to factor $4x^3 + 38x^2 + 110x + 100$.
2. Check your answer by multiplying the factors together.