Jakarta International School

8th Grade – AG1

Practice Test - BLUE

Polynomials and Quadratic Equations

Name: _____

Date: _____

Grade: ◯

Standard Level Learning Goals - Green

Understand and Operate with Polynomials	- Classify polynomials by degree and number of terms - Understand how to add and subtract polynomials - Multiply polynomials by using the distributive property or FOIL memory tool - Understand, recognize, and use Special Product Patterns to multiply polynomials
Graph quadratic functions	- Understand how to graph parabolas using the "3 point method" - Graph quadratic functions that have already been factored - Graph quadratic functions using the x-intercepts and midpoint method
Solve and apply quadratic equations	- Solve quadratic equations that have already been factored - Solve quadratic equations that have a leading coefficient of 1 - Solve quadratic equations with a leading coefficient that is not 1 - Solve quadratic equations that contain special product patterns - Problem solve with quadratic equations

Additional Advanced Concepts - Blue

- Transforming expressions
- Using substitution to solve quadratic equations
- Applying the Quadratic Formula when factoring isn't possible
- Working with similar rectangles

Additional Highly Advanced Concepts - Black

- Deriving the equation for a quadratic function given information about its graph
- Deriving special product patterns geometrically
- Pythagorean Theorem applications
- Radical Equations

A	- All learning goals are met within the standard - The learner independently completes open-ended tasks. - Assessment scores indicate a high level of understanding of skills and concepts. - The learner demonstrates a sophisticated understanding through high order application and performance
B	- Most of the learning goals are met within the standard - The learner occasionally needs support to complete open-ended tasks. - Assessment scores indicate a good grasp of skills and concepts. - The learner demonstrates considerable understanding through application and performance
C	- Some of the learning goals are met within the standard - The learner needs some support to complete open-ended tasks. - Assessment scores indicate satisfactory acquisition of skills and concepts. - The learner demonstrates some understanding through application and performance
D	- Few of the learning goals are met within the standard - The learner needs ongoing support to begin and/or complete tasks. - Assessment scores indicate weak acquisition of skills and concepts. - The learner demonstrates limited understanding through application and performance.
F	- None or almost none of the learning goals are met within the standard - The learner needs significant support to begin and/or complete tasks. - Rarely completes tasks even with support. - Assessment scores indicate minimal grasp of skills and concepts. - The learner does not demonstrate understanding through application and performance.

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Practice Test - BLUE

Polynomials and Quadratic Equations

Name: _____

Date: _____

Score: —

Polynomials Vocabulary

Write each polynomial in standard form. Then, identify each polynomial by degree AND terms.

Variable Expression	Standard Form	Identified by Degree *and* Number of Terms
$2x-5x^2+5$		
$4x^3-3x^3$		
$7w-9-3w$		

Always, Never, or Sometimes

Fill in the blanks of the sentences below with ALWAYS, NEVER, or SOMETIMES.
***** If you answer SOMETIMES, include examples to prove you are correct *****

1. The sum of a trinomial and a binomial is _____ a monomial.

2. The quotient of a quadratic binomial and a linear monomial is _____ a linear monomial.

True or False

For each statement, write true or false. Then, provide an explanation or example to demonstrate your understanding.

3. In the factoring of a trinomial, if the constant term is negative, then the signs in both binomial factors will always be negative. _____

4. The expression $(a+b)^3$ means that the polynomial $(a+b)$ is to be used three times as a factor. _____

5. The graph of $y=(4-x)(3-x)$ opens downwards. _____

6. Find the values of a and b that result in the difference.

$[2ax^2-(b+5)x-4]-[(b+2)x^2-(a-7)x-8]=-x^2-9x+4$

7. The sum of a polynomial and $4x^2-3x+2$ is $5x^3+6x^2-5$. What is the polynomial?

8. Rewrite the following expression $4(x+1)^2-3$ in the form $C+x(B+Ax)$. Then, identify A, B, and C

A =

B =

C =

9. What non-zero integer must be placed in the square so that the simplified product of these two binomials is a binomial?

$(8x+4)(4x+\square)$

Instructions: Appropriately complete each problem. Factor polynomials completely. Solve equations. When and where appropriate, show all possible solutions. Check solutions.

10. $16h^4-8h^2+1=0$

11. $3x^2-36=3x$

12. $x^4 + 1024$

(hint: write an equivalent expression for which you can take advantage of the difference of two squares pattern)

13. $\frac{1}{x^2} - \frac{11}{4x} + \frac{7}{4} = 0$

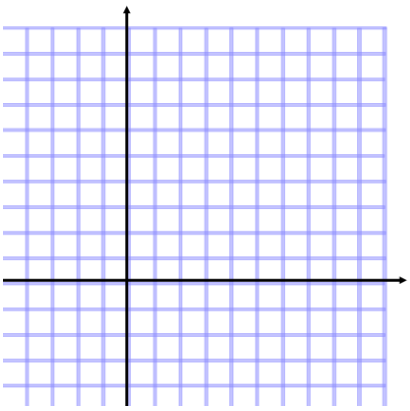
14. $\frac{2x+10}{14} = \frac{9}{3x+3}$

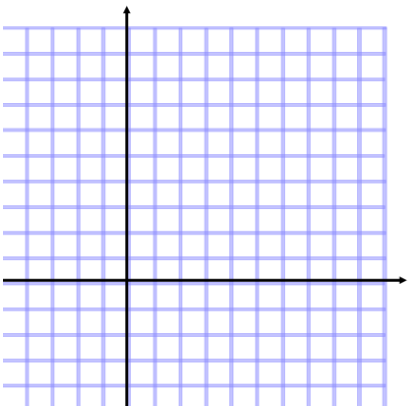
15. $-x^2 - 4x + 2 = 0$

16. Your dance class has decided to perform *The Nutcracker*. *The Nutcracker* is one of the most popular Christmas holiday ballets today.

Your class chooses two primary dancers for the lead roles, one male and one female. One of the male dancer's leaps can be modeled by the equation $h = 2t - t^2$ where h is the height in feet and t is the time in seconds. One of the female dancers' leaps can be modeled by the equation $h = 3t - t^2$.

A. Sketch the graphs of the equations for the male and female dancers.





B. What is the maximum height reached by the male dancer when he leaps?

C. How many seconds does it take the male dancer to reach his maximum jump height?

D. What is the maximum height reached by the female dancer when she leaps?

E. How many seconds does it take the female dancer to reach her maximum height?

Use quadratic equations to solve problems 17 - 21.

Show all steps of your thinking. **Circle your answer.**

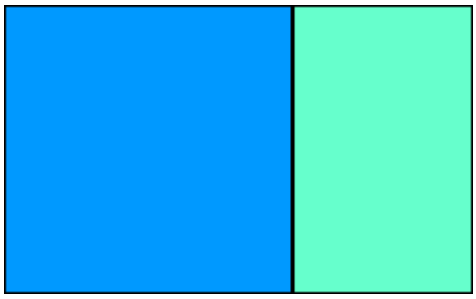
17. If the second of three consecutive positive integers is added to the product of the first and third, the result is 109. Find the integers.

18. The perimeter of a rectangle is 18 meters and its area if 20 square meters. Find the length and width of this rectangle.

19. The floor of a large parking garage has an area of 400 square meters. The garage is 30 meters longer than it is wide. If each car is 2 meters long by 1 meter wide, how many lines of cars, squeezed into the garage from bumper to bumper, will fit in the parking garage? How many cars will be in each row?

20. Jack plans to make a pan by cutting squares from each corner of a 14 cm by 16 cm sheet of tin. After he cuts the squares from each corner, he will fold up the sides of the remaining piece. The bottom of the pan is to have an area of 120 square cm. What is the length of the side of each square that Jack should cut out?

21. I have an interesting rectangle here. If I cut a square off it, the remaining rectangle is similar to the original one (same shape, different size).



If the width of my rectangle is one meter, what is its length? Provide an exact answer.