

Pro-Vision Academy Charter School
High School Math Distance Learning Plan

High School Math
Distance Learning Plan
Week of March 23 - 27

Algebra 1
(Suggested: 90 minutes of off-line activities)

Monday

Write two binomial expressions of the form $(x+b)$, where b is an integer between negative 20 and positive 20. The two expressions you write must be different.

Then, show the steps you would use to add, subtract, and multiply the two polynomial expressions you have written.

Tuesday

Repeat the assignment from Monday, but this time the expressions must be of the form $(ax+b)$ and a cannot be equal to 1. Demonstrate addition, subtraction, and multiplication with these expressions.

Wednesday

Write two NEW binomial expressions as you did on Tuesday. Now, multiply the expressions. Finally, use any method you have learned to factor the result into the original binomial expressions.

Thursday

Choose 20 integers between 10 and 100. Take the square root of each integer. Rewrite each square root as an equivalent term with the number under the radical sign being the lowest possible integer. (Your teacher may have called this simplifying the radical.) Do NOT give the answer as a rounded decimal number.

Friday

The following radical numbers can all be rewritten as a multiple of 2.

$$8=22$$

$$18=32$$

$$32=42$$

$$50=52$$

Which other square roots of integers (up to 101) have this property? Also, find all integers up to 100 which have a square root that can similarly be rewritten as a multiple of 3.

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High School Math Distance Learning Plan

Digital Resources to support daily activities.

- For a review of the aspects of polynomials:
<https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratics-multiplying-factoring/x2f8bb11595b61c86:multiply-monomial-polynomial/v/polynomials-intro>
- For a review of adding polynomials:
<https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:poly-arithmetic/x2ec2f6f830c9fb89:poly-add-sub/v/adding-and-subtracting-polynomials-1>
- For a review of subtracting polynomials:
<https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:poly-arithmetic/x2ec2f6f830c9fb89:poly-add-sub/v/subtracting-polynomials>
- For a review of binomial multiplication:
<https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratics-multiplying-factoring/x2f8bb11595b61c86:multiply-binomial/v/area-model-for-multiplying-binomials>
- For a review of one method of factoring trinomials (This video was originally created for teachers.):
<https://youtu.be/NHK6mifeCTE>
- For a review of “simplifying radical expressions”:
<https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:rational-exponents-radicals/x2f8bb11595b61c86:simplifying-square-roots/v/simplifying-square-roots-1>

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Geometry (Suggested: 90 minutes of off-line activities)

Monday

On a piece of paper, carefully draw the following rectangles (listed by length and width):

- 3 inch by 4 inch
- 5 cm by 12 cm
- 8 cm by 15 cm

Draw and measure one diagonal of each rectangle. Use the Pythagorean Theorem ($a^2+b^2=c^2$) to explain why the triangles formed will be right triangles.

Tuesday

Sketch a circle around each of the rectangles you drew for Monday's assignment. Use the diagonal of each rectangle as the diameter for each circle. (Use a compass or another device such as a round lid to trace each circle.) What do you notice about the relationship of vertices of the rectangles to the circle itself. Write a conjecture describing this pattern.

Wednesday

Draw three new circles of any diameter size. Draw the diameter within the circle. Within each circle, draw a triangle such that one side of the triangle is the diameter and the opposite vertex (the one not on the diameter) is touching the circle. What do you notice about the type of triangle you have drawn? Make a conjecture about all triangles drawn like this.

Thursday

Using the drawing you made for Wednesday's assignment, draw the reflection of each triangle using the diameter of the circle as the line of reflection.

The composite of the triangle and its reflections forms what type of quadrilateral. List three things you know about this type of quadrilateral.

Friday

You will recall that the area of a regular polygon is found using the formula, $A=1/2aP$ where a is the measure of the apothem and P is the measure of the perimeter.

Draw three congruent circles, each with a radius measure of one. In the first circle, inscribe a regular triangle, in the second a square, in the last inscribe a regular hexagon. For each circle, draw a radius to one of the vertices of the inscribed polygon. Now, draw and label each apothem. The following should be the measures for each polygon:

Triangle: side length = 3 and apothem = 12

Square: : side length = 2 and apothem = 22

Hexagon: side length = 1 and apothem = 32

Verify these measures and then calculate the area of each polygon.

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Digital Resources to support daily activities.

- For a review of the Pythagorean Theorem:
<https://www.khanacademy.org/math/basic-geo/basic-geometry-pythagorean-theorem/geo-pythagorean-theorem/v/the-pythagorean-theorem>
- For guidance on triangles inscribing a circle and making right triangles:
<https://www.khanacademy.org/math/geometry/hs-geo-circles/hs-geo-inscribed-shapes/v/right-triangles-inscribed-in-circles-proof>
- For more about the “new” type of quadrilateral that you will discuss on Thursday:
<https://www.khanacademy.org/math/basic-geo/basic-geometry-shapes/basic-geo-quadrilaterals/v/kites-as-a-mathematical-shape>
- For guidance on inscribing polygons in a circle:
<https://www.khanacademy.org/math/geometry/hs-geo-circles/hs-geo-inscribed-polygons/v/constructing-regular-hexagon-inscribed-in-circle>

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Algebra 2
(Suggested: 90 minutes of off-line activities)

Monday

Simplify the following rational expressions, showing all of your steps:

$$\frac{5x-35}{2x-14}$$

$$\frac{x^2-25}{x^2+10x+25}$$

$$\frac{2x^2-5x-3}{5x^2-17x+6}$$

Tuesday

Simplify the following rational expressions, showing all of your steps:

$$\frac{x^3+6x^2+12x+8}{x^3+8}$$

$$\frac{6x^3+x^2-x}{6x^3+5x+x}$$

Wednesday

Simplify the following rational expressions, showing all of your steps:

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

$$\frac{2x}{x-3} - \frac{6}{x-3}$$

Thursday

Simplify the following rational expressions, showing all of your steps:

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

$$\frac{2x}{4x+6} - \frac{10}{10x+15}$$

Friday

Simplify the following rational expressions, showing all of your steps:

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

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

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High School Math Distance Learning Plan

Digital Resources to support daily activities.

- On how to “simplify” rational expressions:
<https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:cancel-common-factor/v/simplifying-rational-expressions-introduction?modal=1>
- Videos on adding and subtracting rational expressions:
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/adding-and-subtracting-rational-expressions-with-like-denominators?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/algebraic-expression-adding-fractions?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/adding-rational-expression-w-unlike-denominators?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/subtracting-rational-expressions-w-unlike-denominators?modal=1>

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PreCalculus
(Suggested: 90 minutes of off-line activities)

Monday

Simplify the following rational expressions, showing all of your steps:

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$$\frac{5x-35}{2x-14} \quad \frac{x^2-25}{x^2+10x+25} \quad \frac{2x^2-5x-3}{5x^2-17x+6} \quad \frac{x^3+6x^2+12x+8}{x^3+8} \quad \frac{6x^3+x^2-x}{6x^3+5x^2+x}$$

Tuesday

Simplify the following rational expressions, showing all of your steps:

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

Wednesday

Simplify the following rational expressions, showing all of your steps:

$$\frac{x+1}{x-2} - \frac{x+2}{x-1} \quad \frac{2x}{x-2} + \frac{x-2}{x+2}$$

Thursday

Simplify the following rational expressions, showing all of your steps (HINT: Factor each polynomial FIRST)

$$\frac{x^2+x-2}{x-3} \cdot \frac{x^2-5x+6}{x-1} \quad \frac{4x^2-1}{x-3} \cdot \frac{3x^2-9}{2x+1}$$

Friday

Use an x-y table to graph the following functions:

- $f(x)=1x$
- $g(x)=xx+1$

Write a paragraph describing the similarities and differences in the graphs you have made of the two functions above.

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- On how to “simplify” rational expressions:
<https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:cancel-common-factor/v/simplifying-rational-expressions-introduction?modal=1>
- Videos on adding and subtracting rational expressions:
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/adding-and-subtracting-rational-expressions-with-like-denominators?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/algebraic-expression-adding-fractions?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/adding-rational-expression-w-unlike-denominators?modal=1>
 - <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:rational/x2ec2f6f830c9fb89:rational-add-sub-intro/v/subtracting-rational-expressions-w-unlike-denominators?modal=1>

Video on Multiplying rational expressions:

https://www.google.com/search?q=multiplying+rational+expressions&rlz=1C1OPRB_enUS665US665&og=multiplying+rational+&ags=chrome.0.0j69i57j0i6.3768j0j7&sourceid=chrome&ie=UTF-8#kpvalbx=_04dvXqzbB4GstQaipKCqCA57

Video on graphing rational functions with a table:

https://www.google.com/search?rlz=1C1OPRB_enUS665US665&ei=ZYhvXsyWCIW6tAaL2YmQAQ&q=graphing+rational+functions+with+a+table&og=graphing+rational+functions+with+a+table&gs_l=psy-ab.3..0i22i30i2.13353.15175..15414...0.2..0.122.1229.8j5.....0....1..gws-wiz.....0i71j0i67j0.dlCQvpHrMXy&ved=0ahUKEwiM3eTXIZ_oAhUFHc0KHytAhIQ4dUDCAs&uact=5#kpvalbx=_dYhvXsPNJsCF9PwP-4OsYA27