BECA/Huson/Algebra 2: Complex Numbers & Rational Exponents Name: SOLUTIONS
30 January 2024

3.4 Do Now: Post-Regents Week review **A.SSE.3c Exponent properties**

1. Identify the expressions that are equal to $\frac{2^2}{2^4}$ $= 2^{2-4} = 2^{-2} = \frac{1}{2^2}$

   (a) 2^6
   (b) $\frac{1}{2^2}$
   (c) 2^{-2}
   (d) $\frac{1}{4}$
   (e) 2^2
   (f) 0.5

2. Identify the expressions that are equal to 2^{-3} $= \frac{1}{2^3} = \frac{1}{8}$

   (a) 2.333...
   (b) $\sqrt{2}$
   (c) $\frac{1}{2^3}$
   (d) $\frac{1}{8}$
   (e) 6
   (f) 0.125

3. Identify the expressions that are equal to $9^{\frac{1}{2}}$ $= \sqrt[2]{9}$

   (a) 9.5
   (b) $\sqrt{3}$
   (c) $\sqrt{9}$
   (d) 3
   (e) 81
   (f) 4.5

A2-F.BF.2 Write arithmetic and geometric sequences with recursive formulas

4. Write a recursive definition of the sequence $a_1 = 3$, $a_2 = 6$, $a_3 = 12$, $a_4 = 24, \ldots$

   $a_1 = 3$ $r = 2$
   $a_n = 2a_{n-1}$

5. A geometric sequence begins $1, 3, 9, \ldots$.

   (a) Write the first six terms of the sequence.
   1, 3, 9, 27, 81, 243

   (b) Find the common ratio r.
   $r = 3$

   (c) Find the sum of the first six terms of the sequence.
   $S = 1\left(\frac{1-3^6}{1-3}\right) = \frac{-728}{-2} = 364$

   (d) Find the sum of the first 20 terms of the sequence.
   $S = 1\left(\frac{1-3^{20}}{1-3}\right) = 1,743,392,200$

6. Find all values of x that make the equation true. (A.REI.4 Solve quadratics)

$x\left(x-1\right)=\left(\frac{12}{x}\right)x$

$x^2-x=12$

$x^2-x-12=0$

$(x-4)(x+3)=0$

$x=4,\ -3$

$(4)-1=\frac{12}{(4)}$ ✓

$3=3$

$(-3)-1=\frac{12}{(-3)}$

$-4=-4$ ✓

7. Given the rational function $r(x)=-1+\frac{x+2}{x-1}$. (F.IF.7d Graph rational functions)

(a) Sketch a graph of the function.

(b) Mark the vertical asymptote as dotted line and label it with its equation.

(c) Explain why the asymptote is located there.

when $x=1$ the function is undefined

$r(1)=-1+\frac{(1)+2}{(1)-1}$

$=-1+\frac{3}{0}$

Zero in the denominator