BECA/Huson/Algebra 2: Complex Numbers & Rational Exponents Name:
6 February 2024

3.7 Pretest: Exponents **A.SSE.3c Exponent properties**

Do Not Use a Calculator

1. Select all of the solutions to $x^2 = 16$.

   (a) $x = 4$
   (b) $x = -4$
   (c) $x = 8$
   (d) $x = -8$
   (e) $x = 16$
   (f) $x = -16$

2. Find the value of each variable that makes the equation true.

   (a) $5^2 \cdot 5^3 = 5^a$
   (b) $\dfrac{3^7}{3^6} = 3^b$
   (c) $7^c = 1$
   (d) $(4^3)^5 = 4^d$
   (e) $2^e = \dfrac{1}{2}$
   (f) $3^4 \cdot f^4 = 15^4$

3. Evaluate each expression.

   (a) $\dfrac{1}{4} \cdot 24$
   (b) $\dfrac{3}{2} \cdot 10$
   (c) $\dfrac{3}{5} \cdot 8 \cdot \dfrac{5}{3}$
   (d) $\dfrac{2}{3} \cdot \dfrac{5}{2} \cdot 9$

4. $p = 3x + 1$ and $q = 2x - 5$.

   For each expression, write an equivalent expression in standard form.

   (a) $p + q$
   (b) $p - q$
   (c) pq

5. Identify the expressions that are equal to $\dfrac{2^2}{2^4}$

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

6. Identify the expressions that are equal to 2^{-3}

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

7. Identify the expressions that are equal to $9^{\frac{1}{2}}$

   (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

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

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

   (a) Write the first six terms of the sequence.

   (b) Find the common ratio r.

   (c) Find the sum of the first six terms of the sequence.

   (d) Find the sum of the first 20 terms of the sequence.

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

$$x - 1 = \frac{12}{x}$$

11. Given the rational function $r(x) = -1 + \dfrac{x+2}{x-1}$. (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.