

## Unit 4: Radicals

### Math 20-2 Assessment Standards

#### Number and Logic

**Specific Outcome 3.** Solve problems that involve operations on radicals and radical expressions with numerical and variable radicands (limited to square roots). [CN, ME, PS, R]

- 3.1 Compare and order radical expressions with numerical radicands.
- 3.2 Express an entire radical with a numerical radicand as a mixed radical.
- 3.3 Express a mixed radical with a numerical radicand as an entire radical.
- 3.4 Perform one or more operations to simplify radical expressions with numerical or variable radicands.
- 3.5 Rationalize the monomial denominator of a radical expression.
- 3.6 Identify values of the variable for which the radical expression is defined.

**Specific Outcome 4.** Solve problems that involve radical equations (limited to square roots or cube roots). [C, PS, R]

*(It is intended that the equations have only one radical.)*

- 4.1 Determine any restrictions on values for the variable in a radical equation.
- 4.2 Determine, algebraically, the roots of a radical equation, and explain the process used to solve the equation.
- 4.3 Verify, by substitution, that the values determined in solving a radical equation are roots of the equation.
- 4.4 Explain why some roots determined in solving a radical equation are extraneous.
- 4.5 Solve problems by modelling a situation with a radical equation and solving the equation.

### What do the Student know from Math 10-C?

Math Common students have a unit on exponents and radicals.

- 2.1 Sort a set of numbers into rational and irrational numbers.
- 2.2 Determine an approximate value of a given irrational number.
- 2.3 Approximate the locations of irrational numbers on a number line, using a variety of strategies, and explain the reasoning.
- 2.4 Order a set of irrational numbers on a number line.
- 2.5 Express a radical as a mixed radical in simplest form (limited to numerical radicands).
- 2.6 Express a mixed radical as an entire radical (limited to numerical radicands).
- 2.7 Explain, using examples, the meaning of the index of a radical.
- 2.8 Represent, using a graphic organizer, the relationship among the subsets of the real numbers (natural, whole, integer, rational, irrational).
- 3.4 Express powers with rational exponents as radicals and vice versa.
- 3.5 Solve a problem that involves exponent laws or radicals.
- 3.6 Identify and correct errors in a simplification of an expression that involves powers.

## What do Student know from Math 20-1?

- 2.1 Compare and order radical expressions with numerical radicands in a given set.
- 2.2 Express an entire radical with a numerical radicand as a mixed radical.
- 2.3 Express a mixed radical with a numerical radicand as an entire radical.
- 2.4 Perform one or more operations to simplify radical expressions with numerical or variable radicands.
- 2.5 Rationalize the denominator of a rational expression with monomial or binomial denominators.
- 2.6 Describe the relationship between rationalizing a binomial denominator of a rational expression and the product of the factors of a difference of squares expression.
- 2.7 Explain, using examples, that  $(-x)^2 = x^2$ ,  $\sqrt{x^2} = |x|$  and  $\sqrt{x^2} \neq \pm x$ ; e.g.,  $\sqrt{9} \neq \pm 3$ .
- 2.8 Identify the values of the variable for which a given radical expression is defined.
- 2.9 Solve a problem that involves radical expressions.
- 3.1 Determine any restrictions on values for the variable in a radical equation.
- 3.2 Determine the roots of a radical equation algebraically, and explain the process used to solve the equation.
- 3.3 Verify, by substitution, that the values determined in solving a radical equation algebraically are roots of the equation.
- 3.4 Explain why some roots determined in solving a radical equation algebraically are extraneous.
- 3.5 Solve problems by modelling a situation using a radical equation.

## What is Coming in Math 30-2

There is a huge unit on exponents and logarithmic functions and equations.