EQT Alignment Sheet – Quarter 1
Course: Math 8

ALCOS Standard	# of Questions	Textbook Alignment
3. Know and apply the properties of integer exponents to generate equivalent numerical expressions. [8-EE1]	4	Ready Math Unit 1 Lesson 1

Sample Problems for Standard #3 (8-EE.1)

1. Evaluate each of the following: (a) $\frac{5^3 \cdot 4^2 \cdot 3^2 \cdot 5^4}{5^8 \cdot 4 \cdot 3}$ (b) $\frac{4^3}{4^{-8}}$ (c) $(3^2)^2 \times 3^{-4}$ (d) $\frac{(8^4)^6 \cdot (8^2)^3}{8^{12}}$

2. Which of the equations below are true?

   (A) $3^5 \cdot 3^7 = 3^{35}$ (B) $(6^3 \cdot 3^3)^2 = 18^6$ (C) $7^{-6} \cdot \frac{1}{7^4} = 7^{-10}$ (D) $\frac{13^4}{13^{-4}} = 13^0$

3. Simplify the following expression: $\frac{4^2 a^3 b^4}{4a^2 b}$

4. A rectangular field is 2^{12} inches long and 2^8 inches wide. Area is found by multiplying the length by the width. Given an expression for the area of the field with a base of 2.

ALCOS Standard	# of Questions	Textbook Alignment
4. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. [8-EE2]	3	Ready Math Unit 1 Lesson 2

Sample Problems for Standard #4 (8-EE.2)

1. Tell whether each equation below is true or false.

   (a) $\sqrt[3]{60} = 20$ (b) $\sqrt[3]{64} = \sqrt{16}$ (c) $25 = \sqrt[3]{125}$ (d) $12 = \sqrt{144}$ (e) $\sqrt{\frac{4}{9}} = \sqrt[3]{\frac{8}{27}}$

2. Sarah wants to purchase a square area rug for her room. She needs the rug to cover 49 square feet. What are the dimensions of the rug she should purchase?

3. Joey wants to buy a small fish tank to sit on a shelf in his room. The shelf will fit a tank that is 12 inches tall. If he buys a cube-shaped tank that has a volume of 1,000 in^3, will it fit on the shelf?

4. Mark walked halfway around a square park that has an area of 90,000 m^2. How many meters did Mark walk?

ALCOS Standard	# of Questions	Textbook Alignment
2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). [8-NS2]	3	Ready Math Unit 1 Lesson 3

Sample Problems for Standard #2 (8-NS.2)

1. Where does 2π approximately lie on a number line?
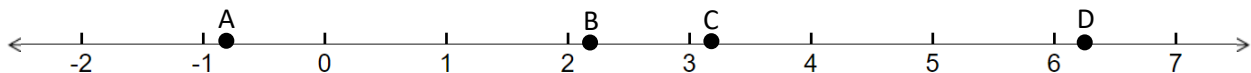
(A) Point A   (B) Point B   (C) Point C   (D) Point D

2. Place each of the following numbers on a number line: (a) 8.2   (b) -4   (c) π (d) $\frac{9}{4}$ (e) $-\frac{2}{3}$ (f) $\frac{7}{8}$ (g) $\sqrt{42}$

ALCOS Standard	# of Questions	Textbook Alignment
5. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. [8-EE3]	1	Ready Math Unit 1 Lesson 4

Sample Problems for Standard #5 (8-EE.3)

1. The approximate distance to the sun is 93,000,000 miles and the wavelength of its ultraviolet light is 0.000035 centimeters. Write both in scientific notation.

2. Ron and Maria turned in their mileage records for the month of April. Ron drove a total of 4.5×10^3 miles, and Maria drove 1.4×10^4 miles. How many more miles did Maria drive than Ron?

ALCOS Standard	# of Questions	Textbook Alignment
6. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. [8-EE4]	2	Ready Math Unit 1 Lesson 5

Sample Problems for Standard #6 (8-EE.4)

1. Evaluate each of the following:

(a) $(6.3 \times 10^4) + (2.1 \times 10^6)$ (b) $(3.2 \times 10^{-5})(2.4 \times 10^8)$ (c) $\frac{9.42 \times 10^5}{3.2 \times 10^2}$

2. Light travels at approximately 2.998 x 10^5 kilometers per second. There are 6.048 x 10^5 seconds in one week. About how many kilometers does light travel in one week?

3. If the number of molecules in 1 mole of a substance is 6.02×10^{23}, find the number of molecules in 100 moles.

ALCOS Standard	# of Questions	Textbook Alignment
11. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8). [8-F1]	4	Ready Math Unit 2 Lesson 6

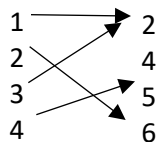### *Sample Problems for Standard #11 (8-F.1)*

1. Consider whether the following relations are functions. Justify your answer.

(a) $\{(0,1), (1,1), (2,1), (3,1), (4,1)\}$ (b)

x	y
0	2
1	5
2	-3
3	2

(c)

2. Does the pattern at the right represent a linear function? Justify your answer.   1, 4, 7, 10, 13,…

ALCOS Standard	# of Questions	Textbook Alignment
12. Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [8-F2] *Example: Given a linear function represented by a table of values and linear function represented by an algebraic expression, determine which function has the greater rate of change.*	3	Ready Math Unit 2 Lesson 7

Sample Problems for Standard #12 (8-F.2)

1. Mr. Obasi planted two types of banana plants. Both types are represented below. Which type of plant is growing at a faster rate?

TYPE 1

Months	0	2	3	5
Height (in)	3	12	16.5	25.5

TYPE 2

The second type of banana plant was five inches tall when planted. It has grown 4 inches every month since being planted.

2. Two functions are shown below.

FUNCTION A

x	0	3	5
y	3	9	13

FUNCTION B

$y = 3x + 2$

Which statement is true about the rates of change?
- (A) The rate of change is 2 for both functions.
- (B) The rate of change is 3 for both functions.
- (C) The rate of change is greater for Function A than Function B.
- (D) The rate of change is greater for Function B than Function A.

3. Which of the following functions has a greater rate of change?

(A) $y = -\frac{3}{4}x + 2$ (B) $\{(1,1), (3,5), (4,7)\}$ (C)

x	0	1	2	3
y	-1	-2	-3	-4

| ALCOS Standard	# of Questions	Textbook Alignment
13. Interpret the equation y = mx + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear. [8-F3] *Example: The function a = s² given the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4), and (3,9), which are not on a straight line.*	2	Ready Math Unit 2 Lesson 8

Sample Problems for Standard #13 (8-F.3)

1. Which equation below does NOT represent a linear function of x?

 (A) $y = -\frac{3}{4}x$ (B) $y = \frac{x}{2}$ (C) $y = -3 + 2x$ (D) $y = 3x^2 - 2$

2. Identify which of the functions below represent a linear function. If the function is linear, identify the slope.

 (A) $y = \frac{x}{3} + 2$ (B) $y = x^2 - 4$ (C)

x	0	1	3	5	8
y	4	2	-2	-6	-12

 (D)

 (E)
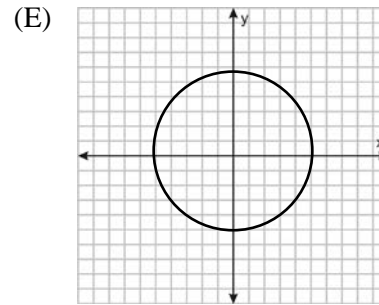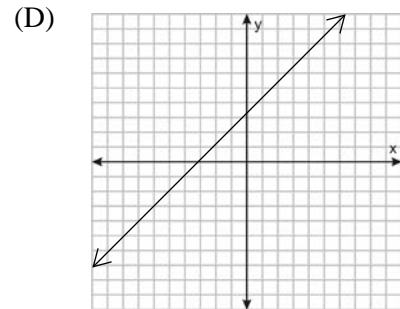
3. Write an equation in slope-intercept form to represent the following situation: James rents a scooter while on vacation. The cost of the scooter is $10 per hour plus a $15 deposit. Then, determine how much James will pay if he rents a scooter for 5 hours.

ALCOS Standard	# of Questions	Textbook Alignment
14. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of linear function in terms of the situation in models and in terms of its graph or a table of values. [8-F4]	3	Ready Math Unit 2 Lesson 9

Sample Problems for Standard #14 (8-F.4)

1. Find the equation of a line in slope-intercept form that passes through the points (3,6) and (6,-8).

2. Jimmie's estimate for the cost of carpeting a rom is $60 for tools and $3 per square foot for carpet. Determine if this situation can be modeled with a linear function. If so, find the linear function.

3. The cost to rent a bike at the city park includes an initial fee of $7.00 plus $3.50 per hour. Find an equation that models the relationship between the cost, y, and the number of hours, x, that the bike is rented.

4. Filipe is paid $1,000 every month plus an additional $150 bonus for every tractor he sells. Write an equation to represent the total amount of money, y, Filipe makes each month based on the number of tractors, n, he sells.