Algebra 1 Unit 1 quiz 3: Interpreting the parts of an expression, Units, quantities and a sensible level of accuracy, Estimating a huge quantity from small facts

Name _____ Date _____ Period _____

8 questions, 21 points

1. A conveyor belt at a grocery checkout moves at 35 centimeters per second. Write its speed in meters per minute. (2 points)

2. A roll holds 7 m of ribbon. Hannah cuts 7 pieces, each 25 cm long. How many centimeters of ribbon are left on the roll? (2 points)

3. Hannah and Carlos cycle toward each other along a straight road, starting 58 km apart. Hannah rides at 13 km/h and Carlos at 16 km/h. After t hours the distance between them is

$$58 - (13 + 16)t$$

kilometers. (3 points)

(a) What does the sum in parentheses, (13 + 16), stand for, with units, and what does $(13 + 16)t$ measure?

(b) How far apart are they after 1 hour?

(c) After how many hours do they meet?

4. Owen estimates how many garbage trucks a city needs. Assumptions: the city has about 80,000 homes, each home puts out about 2 bags of trash a week, and one truck can collect about 1,000 bags a week. (3 points)

(a) Find the estimate, with the units shown.

(b) A classmate argues that there are 3 times as many homes as Owen assumed, and that one truck can collect 2 times as many bags. Without redoing the whole chain, find the new estimate.

5. Answer from the structure of $10 - \dfrac{12}{x^2 + 2}$, not from a table of values. (3 points)

(a) What is the smallest value of the expression, and for which x does it happen?

(b) Can the expression ever equal 10? Explain.

(c) Find every x for which it equals 7.

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6. For the number of bricks in a school building, Mateo estimates 800,000 and David estimates 4,000,000. (3 points)

(a) Give the order of magnitude of each estimate.

(b) How many times the smaller estimate is the larger? Do the two estimates agree to an order of magnitude?

7. Hannah plans to count aloud from 1 to 1 000 000. Assume each number takes about 2 seconds to say, and that Hannah counts for 4 hours a day. Estimate how many days it takes, to two significant figures, showing the units cancel. (2 points)

8. A doctor prescribes 10 milligrams of a medicine per kilogram of body mass. The patient's mass is 24 kg, and the liquid medicine contains 200 mg in every 5 mL. Write one chain of factors that turns the patient's mass into a dose in milliliters, and find the dose. (3 points)

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