

First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_

107 - FQ - Period, Frequency, Speed

Use the following information to answer Q1-Q3:

A 20.0 kg girl is on the edge of a very heavy merry-go-round with a diameter of 3.00 meters that is spinning with a rotational period of 1.80 seconds. The merry-go-round is packed with other children.

Q1: The girl is travelling with a speed of \_\_\_\_ m/s.

(Record your **three digit** answer in the Numerical Response boxes below)

5	.	2	4
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$$T = 1.80 \text{ s}$$

$$m = 20.0 \text{ kg}$$

$$r = 1.50 \text{ m}$$

$$v = \frac{2\pi r}{T} = \frac{2\pi(1.50)}{(1.80)} = 5.23598... \text{ m/s}$$

$$v \approx 5.24 \text{ m/s}$$

Q2: The girl has a rotational frequency of  $a.bc \times 10^d$  Hz, where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_\_\_, \_\_\_\_, \_\_\_\_, and \_\_\_\_.

(Record your **four digit** answer in the Numerical Response boxes below)

5	5	6	1
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$$f = \frac{1}{T} = \frac{1}{(1.80)} = 0.\bar{5} \text{ Hz}$$

$$f \approx 0.5555 \text{ Hz}$$

$$f \approx 5.56 \times 10^{-1} \text{ Hz}$$

Q3: The girl has a rotational frequency of  $a.bc \times 10^d$  rpm, where  $a$ ,  $b$ ,  $c$ , and  $d$  are \_\_\_\_, \_\_\_\_, \_\_\_\_, and \_\_\_\_.

(Record your **four digit** answer in the Numerical Response boxes below)

3	3	3	1
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$$f = \frac{0.555\bar{5} \text{ cycles}}{\text{s}} \times \frac{60 \text{ s}}{\text{min}} = \frac{33.\bar{3} \text{ cycles}}{\text{min}}$$

$$f = 33.\bar{3} \text{ rpm}$$

$$f \approx 3.33 \times 10^1 \text{ rpm}$$

Use the following additional information to answer Q4:

<b>Change in Quantity:</b>		
1 – Increase	2 – Decrease	3 – Stay the same

**Q4:** The girl moves inward towards the center of the *merry-go-round*. Her rotational speed   **a**  , her rotational frequency   **b**  , and her rotational period   **c**  , where **a**, **b**, and **c** are \_\_\_\_, \_\_\_\_, and \_\_\_\_.

(Record your **three digit** answer in the Numerical Response boxes below)

2	3	3	
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**MARKING:**

Beginning	0 – 1.5
Progressing	2 – 2.5
Competent	3 – 3.5
Exemplary	4