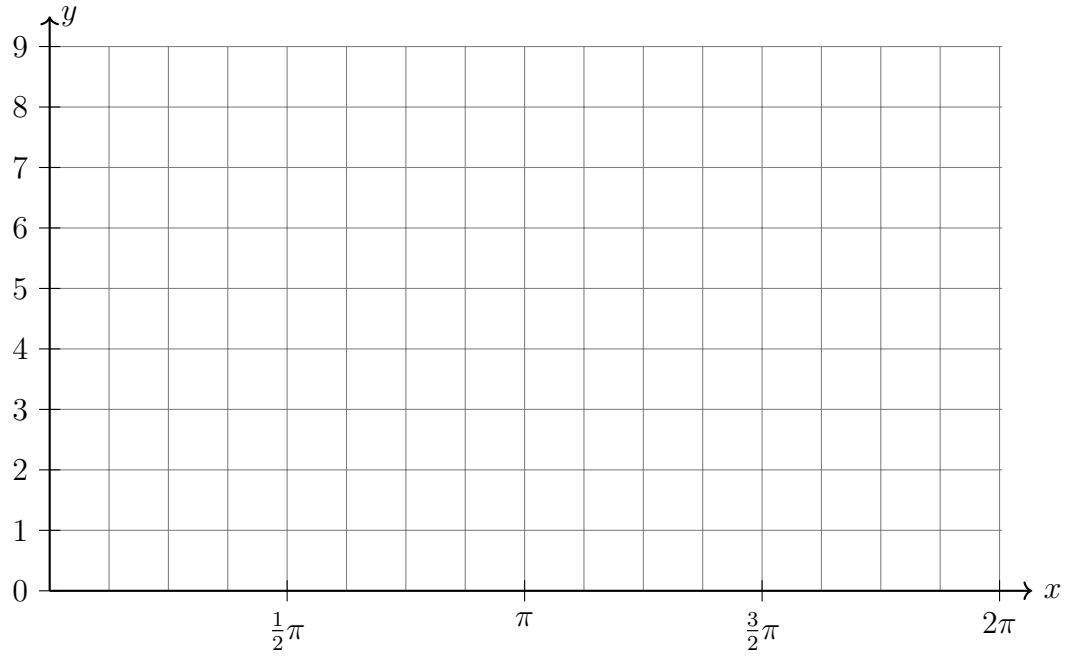
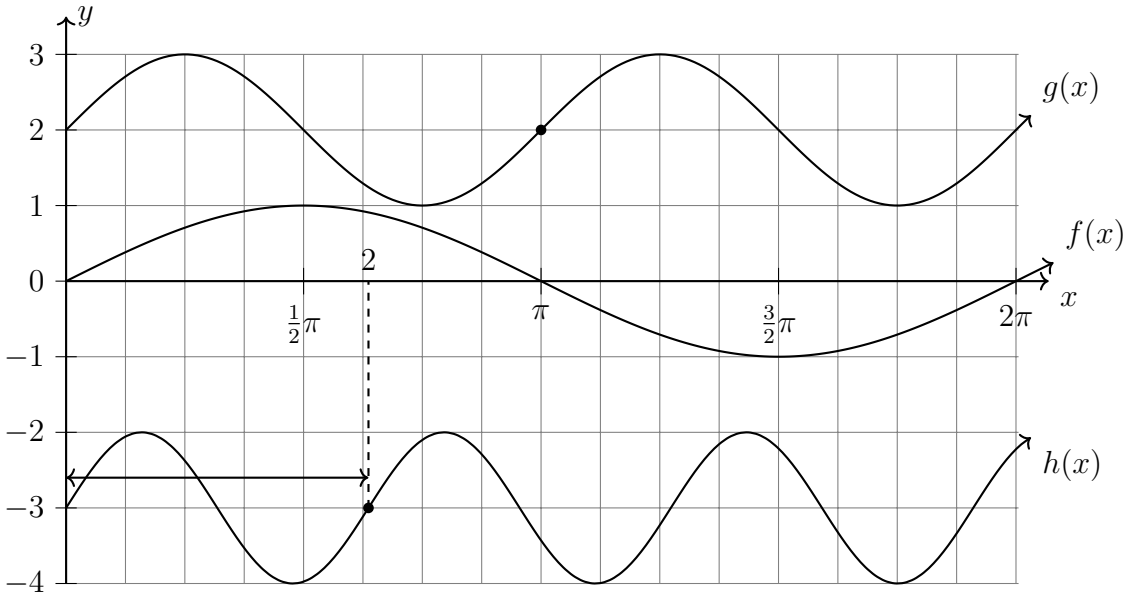
BECA/Huson/Algebra 2: Regents Preparation Name:
7 June 2024

Prep #25 Periodic functions

1. Graph the function $f(x) = 2\sin x + 6$. Notate the midline, amplitude, relative minimum and maximum, zeros.



2. The function $f(x) = \sin x$ is shown on the graph below as well as two other periodic functions, $g(x)$ and $h(x)$. Write down the period and equation for each function.



3. A person's lung capacity can be modeled by the function $C(t) = 250\sin(\frac{2\pi}{5}t) = 2450$, where $C(t)$ represents the volume in mL present in the lungs after t seconds. State the maximum value of this function over one full cycle, and explain what this value represents.

4. A periodic function $f(x)$ is shown on the graph below.

   (a) Write down the amplitude, period, and midline equation of the function.

   (b) Write the equation for $f(x)$.

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5. Write a recursive formula for the sequence 121, 12.1, 1.21, 0.121, ...

6. When a ball bounces, the heights of consecutive bounces form a geometric sequence. The height of the first bounce is 121 centimeters and the height of the third bounce is 64 centimeters. To the *nearest centimeter*, what is the height of the fifth bounce?

bounce	1	2	3	4	5
height (cm)	121		64		

7. Rowan is training to run in a race. He runs 15 miles in the first week, and each week following, he runs 3% more than the week before. Using a geometric series formula, find the total number of miles Rowan runs over the first ten weeks of training, rounded to the *nearest thousandth*.

8. Given $P(A) = \frac{1}{3}$ and $P(B) = \frac{5}{12}$, where A and B are independent events. Determine $P(A \cap B)$.

9. The set of data in the table below shows the results of a survey on the number of messages that people of different ages text on their cell phones each month.

Age Group	0-10	11-50	Over 50
15-18	4	37	68
19-22	6	25	87
23-60	25	47	157

If a person from this survey is selected at random, what is the probability that the person texts over 50 messages per month given that the person is between the ages of 23 and 60?

10. The scores on a collegiate mathematics readiness assessment are approximately normally distributed with a mean of 680 and a standard deviation of 120.

Determine the percentage of scores between 690 and 900, to the *nearest percent*.