1. (2pt) Each of the three plots below shows the graph of a function. Circle any that are periodic (possibly more than one).

![Graphs](image)

Answer: Only the middle graph is periodic

2. (1pt) Suppose that $f$ is a periodic function whose period is 12. Suppose, also, that $f(-1) = 5$. Find any other output of $f$. That is, pick some other value of $x$ (as long as it is not $-1$) and find $f(x)$. To answer this question, all you need to do is fill in the blanks below. This question has many answers; you only need to find one.

$$f(\text{______}) = \text{______}$$

Answer: If $n$ is any integer except 0 then $f(-1 + 12n) = 5$ is a correct answer.

3. Consider the triangle below.

![Triangle](image)

(a) (3pt) Find $\ell$. Leave your answer in exact form.

Answer: $\ell = 13$

(b) (2pt) Find $\cos(\theta)$. Leave your answer in exact form.

Answer: $\cos(\theta) = \frac{12}{13}$

(c) (2pt) Find $\sin(\theta)$. Leave your answer in exact form.

Answer: $\sin(\theta) = \frac{5}{13}$

4. (2pt) Find the degree measure of $\phi$ and $\alpha$ below.

![Angles](image)

Answer: $\phi = 225^\circ$ and $\alpha = 50^\circ$
5. Consider the triangle below.

(a) (2pt) Find the degree measure of $\phi$.

**Answer:** $\phi = 56^\circ$

(b) (3pt) Find $\ell$. Round to two decimal places.

**Answer:** $\ell = 16.09$

6. (3pt) Suppose $\theta$ is an angle such that $\sin(\theta) = 0.38$ and $\cos(\theta) < 0$. Find $\cos(\theta)$ and round to two decimal places.

**Answer:** $\cos(\theta) = -0.93$