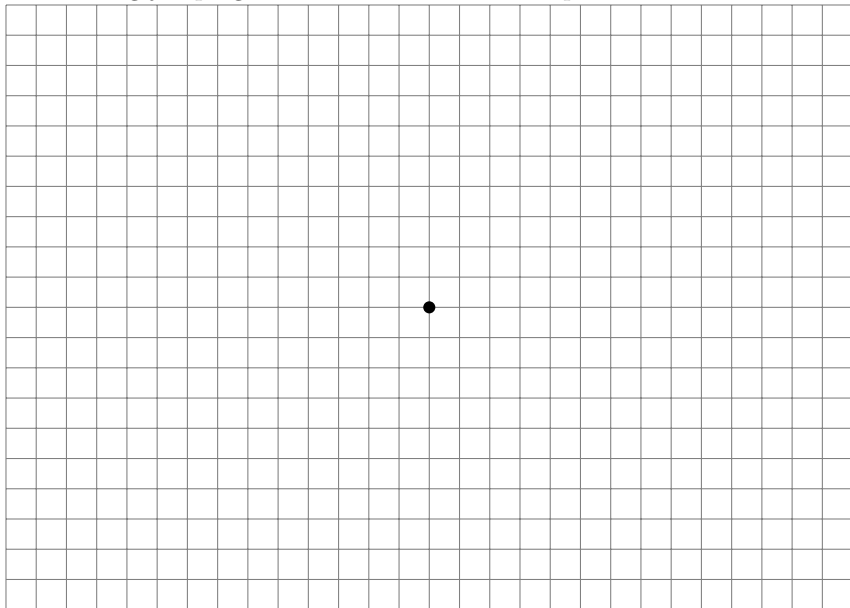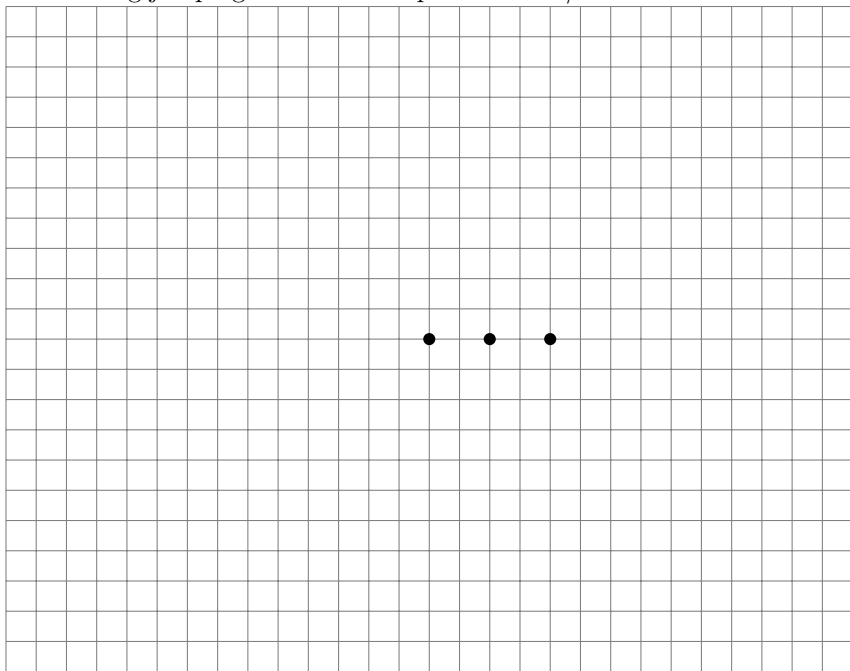Consider a bug jumping at rest in the water. The speed of water waves is 3 cm/s.

Consider a bug jumping forward at a speed of 2 cm/s.

- When an object moves **toward** you, the frequency of waves is _____
- When an object moves **away from** you, the frequency of waves is _____

$$f =$$
$$f_s =$$
$$v =$$
$$v_s =$$
$$v_o =$$

- when object is moving **toward** the other one, use _____
- when object is moving **away from** the other one, use _____

speed of sound in room-temperature air:

Example You are on the road driving at 35 m/s. An ambulance approaches you from behind traveling at 42 m/s. The sirens on the ambulance emit a frequency of 890 Hz.

(a) What frequency do you hear?

(b) After the ambulance passes you, what frequency do you hear?