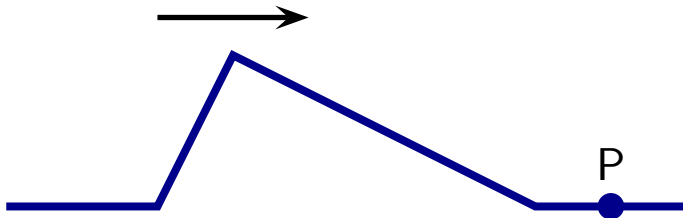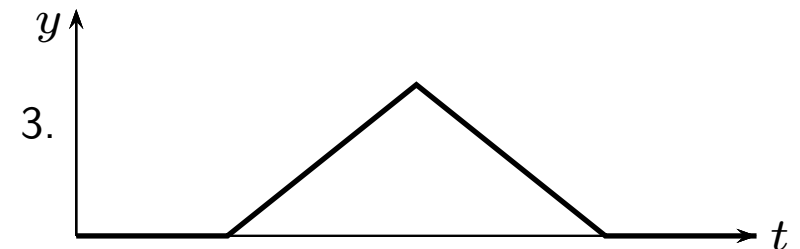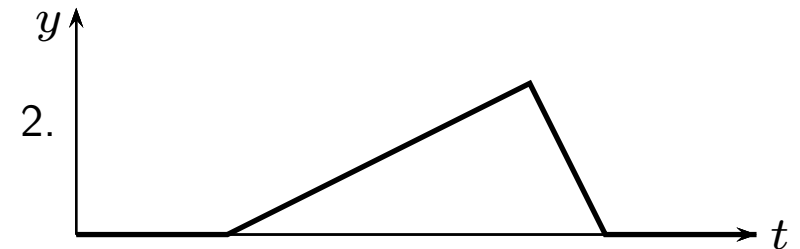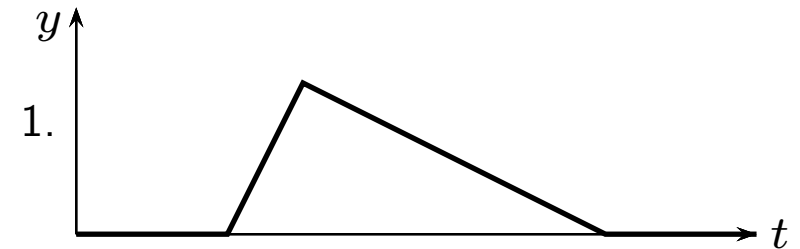# Question 1

A triangular shaped pulse propagates along a string at a constant speed. A snapshot at one instant is illustrated.
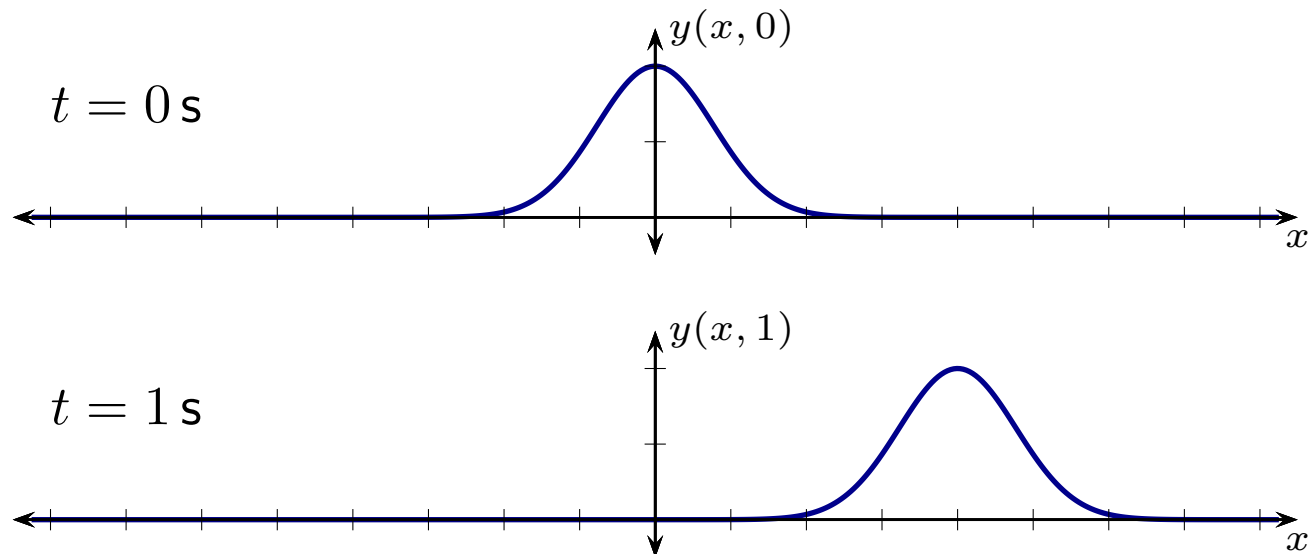

Which of the following best represents the vertical position of the point on the string labeled P as time passes?
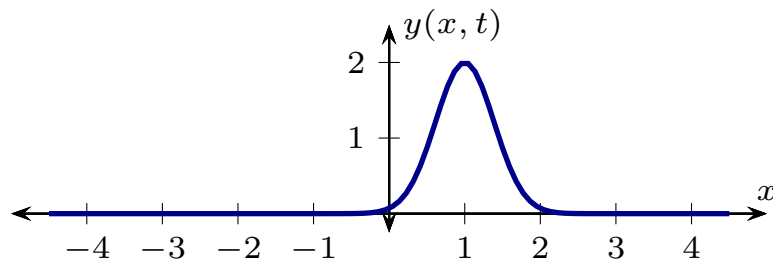
1.

2.

3.

Gaussian Pulses

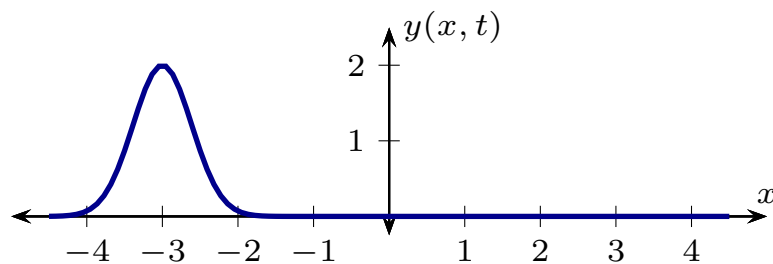One possible Gaussian pulse: $y(x,t) = e^{-(x-4t)^2/1}$. Illustrated at two times.

$t = 0\,\mathrm{s}$

$t = 1\,\mathrm{s}$

Question 2

Two snapshots of a string at intervals $2\,\mathrm{s}$ apart are as illustrated.

Earlier instant

Later instant
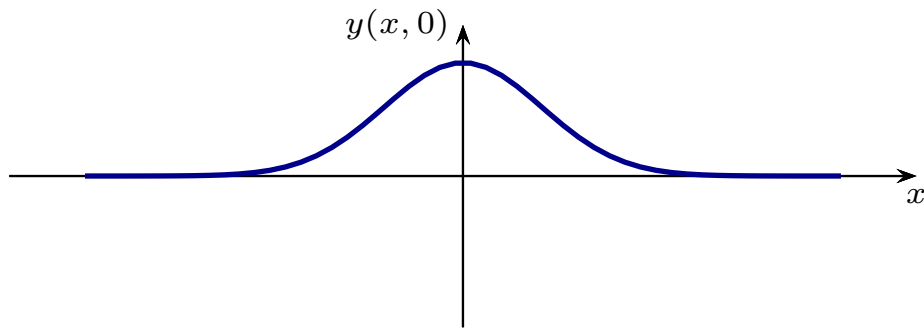

Which of the following best describes this pulse?

1. $y(x,t) = 2e^{-(x-3t)^2/a^2}$

2. $y(x,t) = 2e^{-(x-2t)^2/a^2}$

3. $y(x,t) = 2e^{-(x+t)^2/a^2}$

4. $y(x,t) = 2e^{-(x+2t)^2/a^2}$

5. $y(x,t) = e^{-(x-2t)^2/a^2}$

Question 3

A particular Gaussian pulse is:

$$y(x, t) = e^{-(x - vt)^2/2}.$$

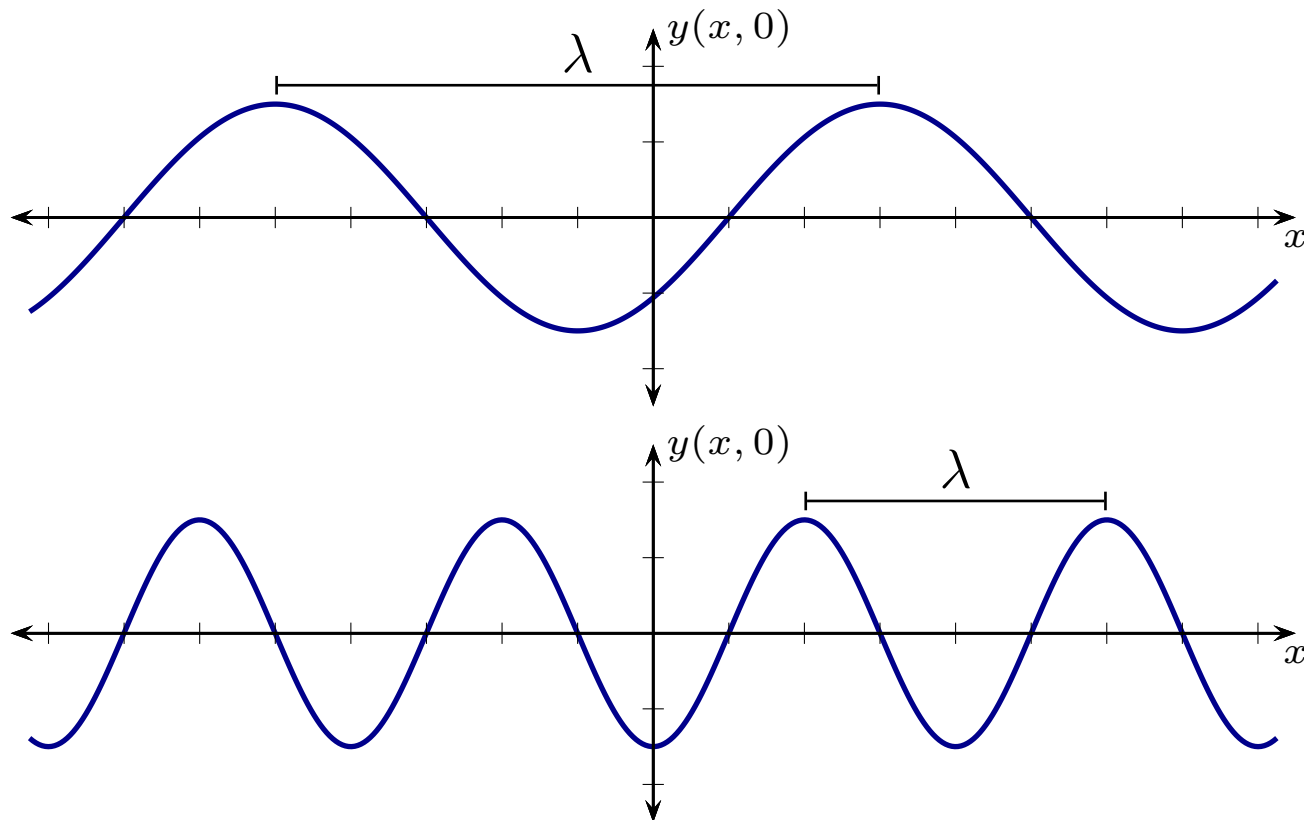A snapshot of this at $t = 0$ is illustrated below.

Which of the following is/are true about the velocities with which points on the string move?

1. All points move with velocity v.

2. The maximum velocity occurs at $x = 0$.

3. The velocity is negative for $x < 0$ and positive for $x > 0$.

4. The velocity is negative for $x > 0$ and positive for $x < 0$.

Sinusoidal Wave

Snapshots of sinusoidal waves.

Question 4

A left moving sinusoidal wave has the form:

$$y(x, t) = A \sin\left[k\left(x + vt\right)\right].$$

Which of the following is the angular frequency of oscillation?

1. $\omega = kv$

2. $\omega = kvt$

3. $\omega = kx$

4. $\omega = k$

5. $\omega = kt$