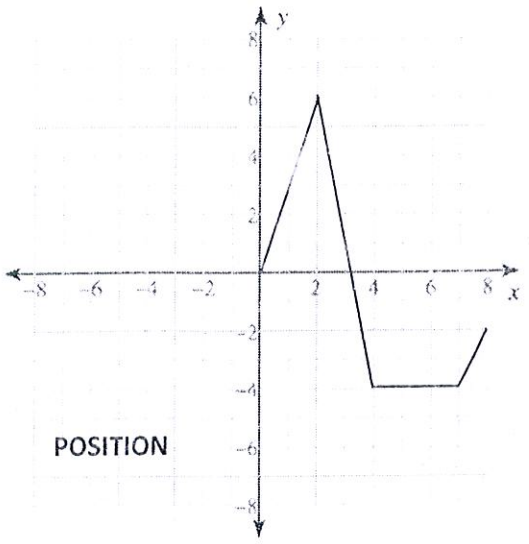
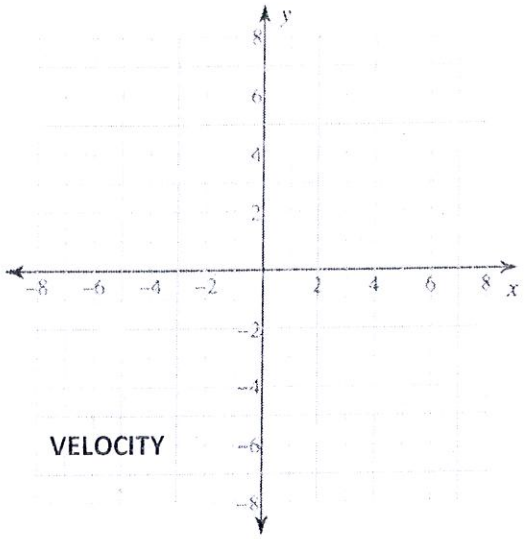
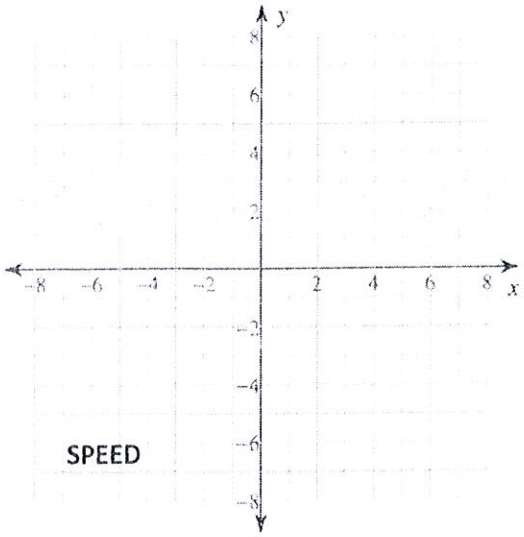
Given position s(t) graphed below, provide the graphs for velocity, speed, and acceleration



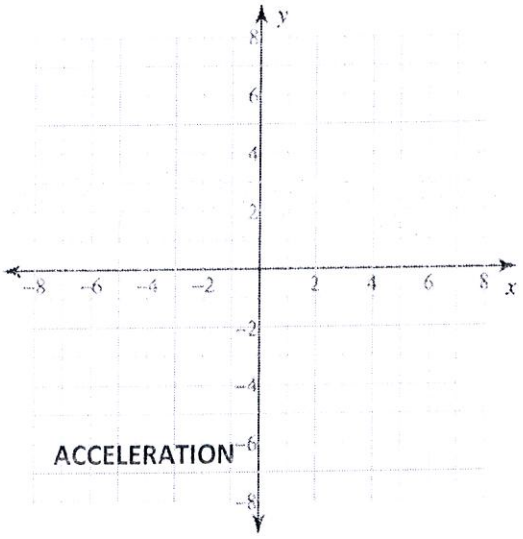
POSITION



VELOCITY

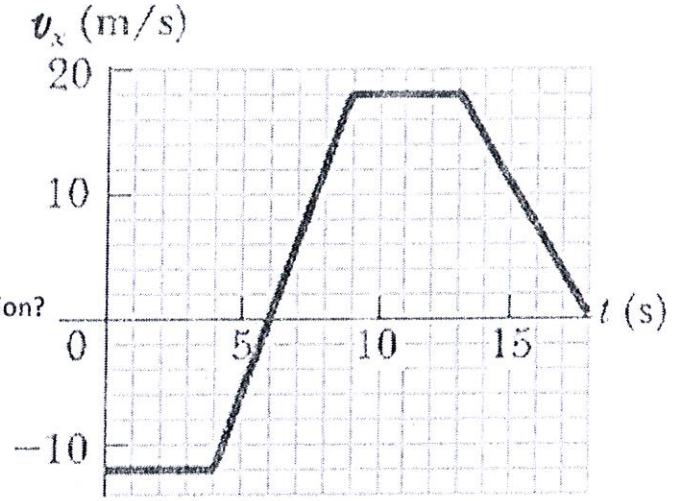


SPEED



ACCELERATION

Answer questions about the given velocity graph



a. What is the velocity at 6 seconds?

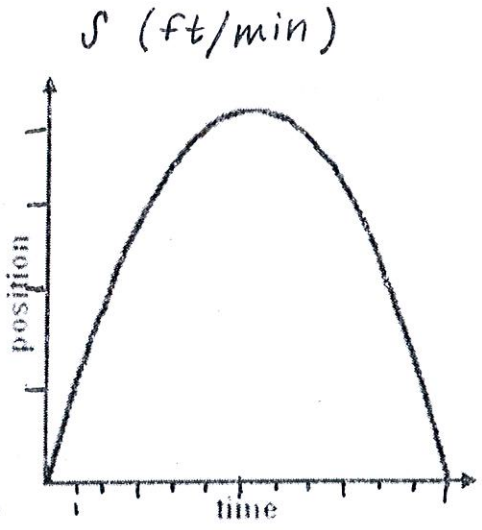
b. When is the particle at rest? Justify.

c. When is the particle moving in a positive direction? Justify.

d. What is the acceleration at 6 seconds?

e. When is the particle speeding up and slowing down? Justify.

Answer questions about the given position graph



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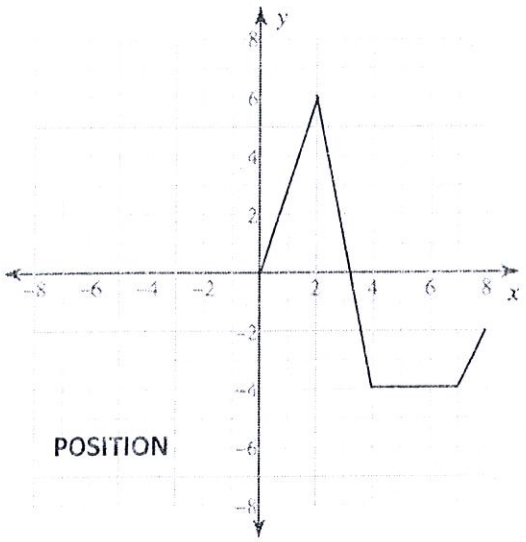
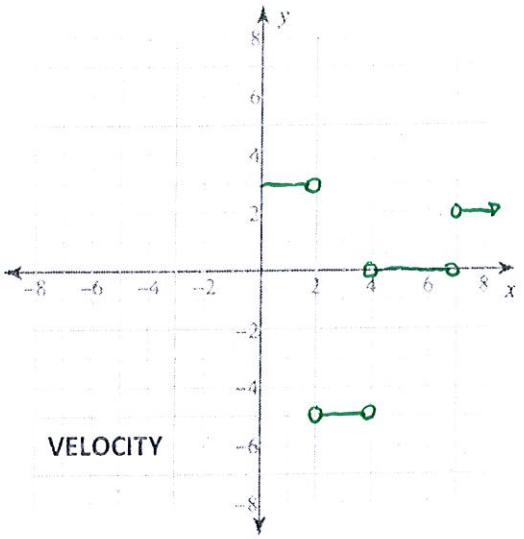
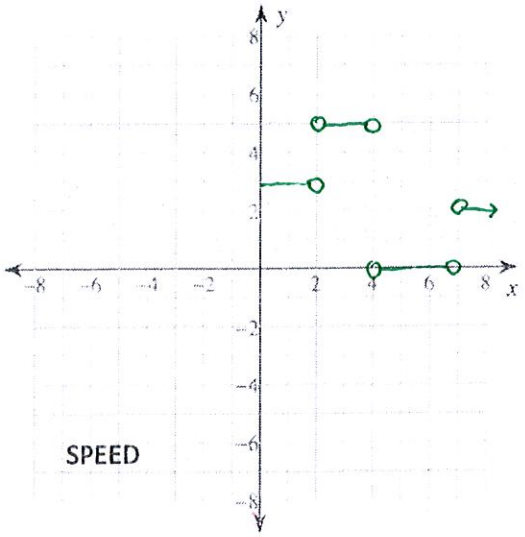


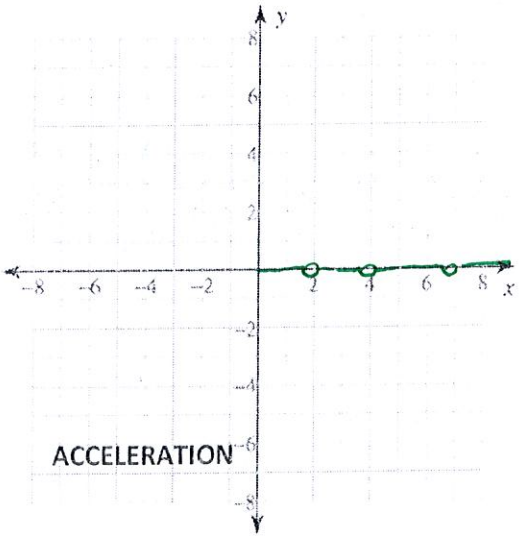
POSITION



VELOCITY

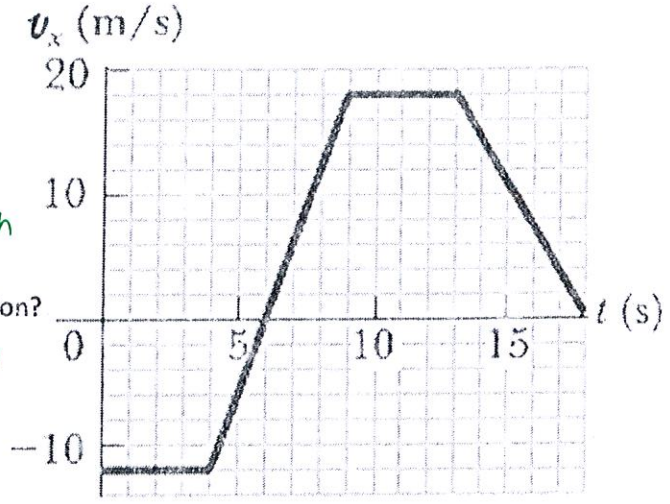


SPEED



ACCELERATION

Answer questions about the given velocity graph



a. What is the velocity at 6 seconds?

$v(6) = 0$ m/s

b. When is the particle at rest? Justify.

$t = 6, 18$ seconds because that's when $v(t) = 0$

c. When is the particle moving in a positive direction? Justify. (6, 18) seconds because that's when $v(t) > 0$

d. What is the acceleration at 6 seconds?

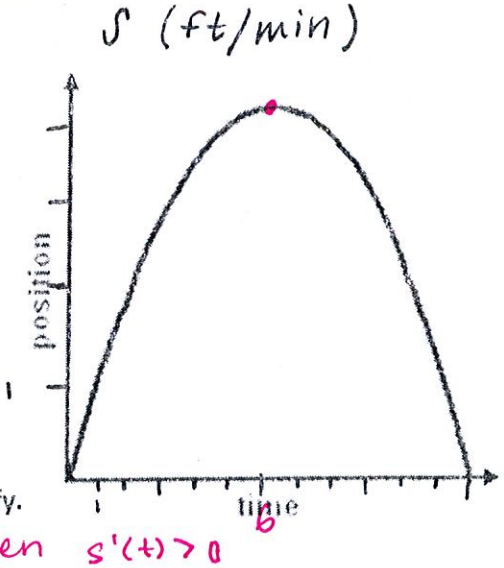
3 m/s^2

e. When is the particle speeding up and slowing down? Justify.

speeding up: (6, 9) seconds → when $v(t)$ + $a(t)$ have same signs

slowing down: (13, 18) seconds → when $v(t)$ + $a(t)$ have different signs

Answer questions about the given position graph



a. What is the velocity at 6 seconds?

0 ft/min

b. When is the particle at rest? Justify.

$t = 6$ min because $s'(6) = 0$

c. When is the particle moving in a positive direction? Justify.

(0, 6) minutes because that's when $s'(t) > 0$

d. When is the particle speeding up and slowing down? Justify.

speeding up: (6, 12) min → when $v(t)$ and $a(t)$ have same signs

slowing down: (0, 6) min → when $v(t)$ and $a(t)$ have same signs