

Calculus Practice: Rectilinear Motion 1b

A particle moves along a coordinate line. Its velocity function is $v(t)$ for $t \geq 0$. For each problem, find the position function $s(t)$.

1) $v(t) = -4t^3 + 33t^2; s(0) = 0$

2) $v(t) = 4t^3 - 45t^2; s(0) = 0$

3) $v(t) = 4t^3 - 30t^2; s(0) = 0$

4) $v(t) = 3t^2 - 24t; s(0) = 0$

5) $v(t) = 4t^3 - 42t^2; s(0) = 0$

6) $v(t) = -4t^3 + 24t^2; s(0) = 0$

7) $v(t) = -4t^3 + 39t^2; s(0) = 0$

8) $v(t) = -2t + 11; s(0) = 26$

9) $v(t) = 4t^3 - 39t^2; s(0) = 0$

10) $v(t) = 3t^2 - 26t; s(0) = 0$

A particle moves along a coordinate line. Its acceleration function is $a(t)$ for $t \geq 0$. For each problem, find the position function $s(t)$ and the velocity function $v(t)$.

11) $a(t) = -2$; $s(0) = -63$; $v(0) = 16$

12) $a(t) = -12t^2 + 90t$; $s(0) = 0$; $v(0) = 0$

13) $a(t) = 2$; $s(0) = 143$; $v(0) = -24$

14) $a(t) = -12t^2 + 48t$; $s(0) = 0$; $v(0) = 0$

15) $a(t) = 2$; $s(0) = 40$; $v(0) = -14$

16) $a(t) = -2$; $s(0) = 11$; $v(0) = 10$

17) $a(t) = 2$; $s(0) = -84$; $v(0) = -5$

18) $a(t) = -12t^2 + 84t$; $s(0) = 0$; $v(0) = 0$

19) $a(t) = -6t + 60$; $s(0) = 0$; $v(0) = -225$

20) $a(t) = -2$; $s(0) = 90$; $v(0) = 9$

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A particle moves along a coordinate line. Its velocity function is $v(t)$ for $t \geq 0$. For each problem, find the position function $s(t)$.

1) $v(t) = -4t^3 + 33t^2; s(0) = 0$

$s(t) = -t^4 + 11t^3$

2) $v(t) = 4t^3 - 45t^2; s(0) = 0$

$s(t) = t^4 - 15t^3$

3) $v(t) = 4t^3 - 30t^2; s(0) = 0$

$s(t) = t^4 - 10t^3$

4) $v(t) = 3t^2 - 24t; s(0) = 0$

$s(t) = t^3 - 12t^2$

5) $v(t) = 4t^3 - 42t^2; s(0) = 0$

$s(t) = t^4 - 14t^3$

6) $v(t) = -4t^3 + 24t^2; s(0) = 0$

$s(t) = -t^4 + 8t^3$

7) $v(t) = -4t^3 + 39t^2; s(0) = 0$

$s(t) = -t^4 + 13t^3$

8) $v(t) = -2t + 11; s(0) = 26$

$s(t) = -t^2 + 11t + 26$

9) $v(t) = 4t^3 - 39t^2; s(0) = 0$

$s(t) = t^4 - 13t^3$

10) $v(t) = 3t^2 - 26t; s(0) = 0$

$s(t) = t^3 - 13t^2$

A particle moves along a coordinate line. Its acceleration function is $a(t)$ for $t \geq 0$. For each problem, find the position function $s(t)$ and the velocity function $v(t)$.

11) $a(t) = -2$; $s(0) = -63$; $v(0) = 16$
 $s(t) = -t^2 + 16t - 63$, $v(t) = -2t + 16$

12) $a(t) = -12t^2 + 90t$; $s(0) = 0$; $v(0) = 0$
 $s(t) = -t^4 + 15t^3$, $v(t) = -4t^3 + 45t^2$

13) $a(t) = 2$; $s(0) = 143$; $v(0) = -24$
 $s(t) = t^2 - 24t + 143$, $v(t) = 2t - 24$

14) $a(t) = -12t^2 + 48t$; $s(0) = 0$; $v(0) = 0$
 $s(t) = -t^4 + 8t^3$, $v(t) = -4t^3 + 24t^2$

15) $a(t) = 2$; $s(0) = 40$; $v(0) = -14$
 $s(t) = t^2 - 14t + 40$, $v(t) = 2t - 14$

16) $a(t) = -2$; $s(0) = 11$; $v(0) = 10$
 $s(t) = -t^2 + 10t + 11$, $v(t) = -2t + 10$

17) $a(t) = 2$; $s(0) = -84$; $v(0) = -5$
 $s(t) = t^2 - 5t - 84$, $v(t) = 2t - 5$

18) $a(t) = -12t^2 + 84t$; $s(0) = 0$; $v(0) = 0$
 $s(t) = -t^4 + 14t^3$, $v(t) = -4t^3 + 42t^2$

19) $a(t) = -6t + 60$; $s(0) = 0$; $v(0) = -225$
 $s(t) = -t^3 + 30t^2 - 225t$, $v(t) = -3t^2 + 60t - 225$

20) $a(t) = -2$; $s(0) = 90$; $v(0) = 9$
 $s(t) = -t^2 + 9t + 90$, $v(t) = -2t + 9$