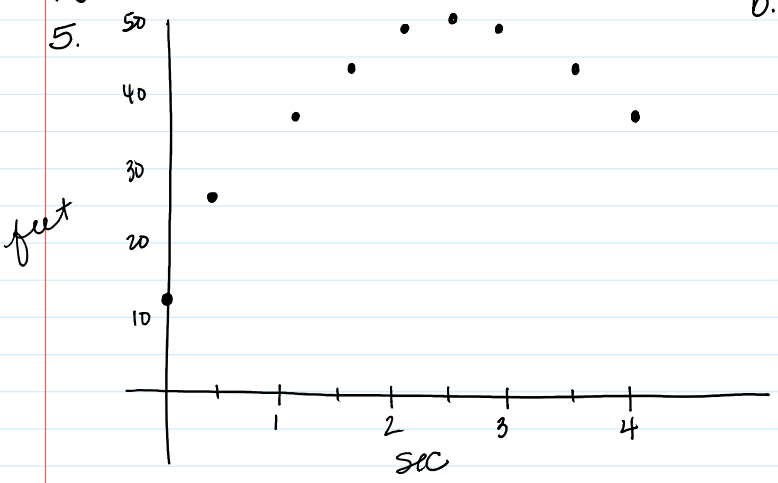
3.4 day 3

Sunday, September 3, 2017 10:35 PM

pg. 138 # 5, 9, 10, 14, 18

5.



b. Estimate of velocity at . . .

$t = 1$ use points closest to 1s: 0.5s & 1.5s

$$v \approx \frac{44 - 26}{1.5 - 0.5} = 18 \frac{ft}{s}$$

$t = 2.5$

$$v \approx \frac{48.5 - 48.5}{3 - 2} = 0 \frac{ft}{s}$$

$t = 3.5$

$$v \approx \frac{36.5 - 48.5}{4 - 3} = -12 \frac{ft}{s}$$

9. a. Moves forward $\Rightarrow v(t) > 0$ $0 \le t < 1,\ 5 < t < 7$

Moves backward $\Rightarrow v(t) < 0$ $1 < t < 5$

Speeds up $\Rightarrow$ $v(t) > 0$ AND increasing $5 < t < 7$

OR

$v(t) < 0$ AND decreasing $1 < t < 2$

Slows down $\Rightarrow$ $v(t) > 0$ AND decreasing $0 \le t < 1,\ 6 < t < 7$

OR

$v(t) < 0$ AND increasing $3 < t < 5$

b. Acceleration = velocity′ > 0 from $3 < t < 6$

< 0 from $0 \le t < 2,\ 6 < t < 7$

$= 0$ from $2 < t < 3,\ 7 < t \le 9$

c. $2 < t < 3$ seconds (don't worry about direction)

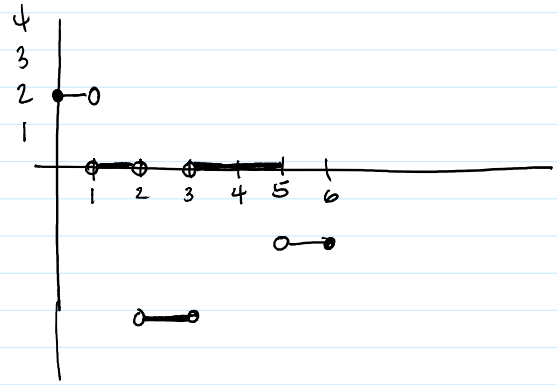
d. Stand still $\rightarrow$ velocity $= 0$ but we want for more than an instant

So $7 < t \leq 9$

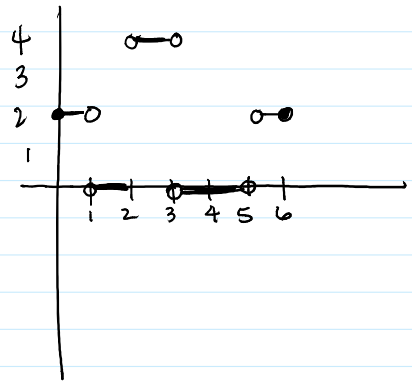
10. a. Moves left from $2 < t < 3$ seconds, $5 < t \leq 6$ seconds
Moves right from $0 \leq t < 1$ seconds
Stands still from $1 < t < 2$ seconds, $3 < t < 5$ seconds

b.

velocity



speed = |velocity|

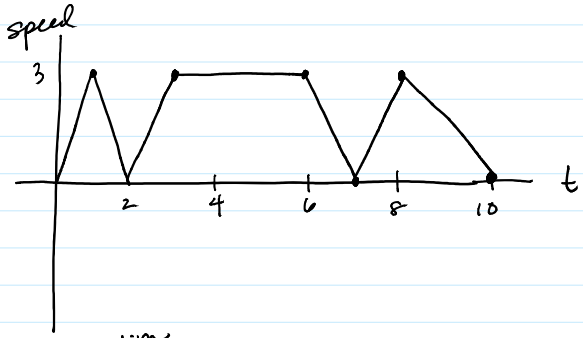


11. a. when $v(t)$ changes from ⊕ to ⊖ or ⊖ to ⊕ AKA $v(t) = 0$

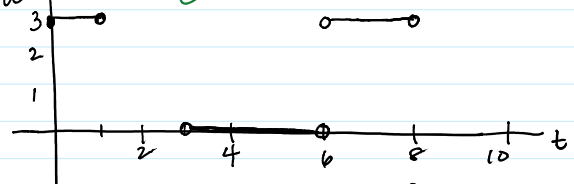
$t = 2, 7$

b. $3 < t < 6$

c. speed = |velocity|

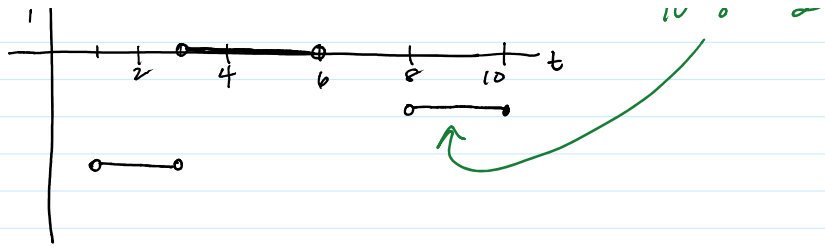


d. acceleration



Calculate slopes of the velocity graph, i.e.

$\frac{0-3}{10-8} = \frac{-3}{2}$



16. From moon's surface:

$-2.6t^2 = 0$

$t(832 - 2.6t) = 0$

$t = 0$ or $832 - 2.6t = 0$

$t = 320$ seconds

From Earth's surface:

$832t - 16t^2 = 0$

$(832 - 16t) = 0$

$t = 0$ or $832 - 16t = 0$

$t = 52$ seconds

18. a. 190 ft/s

b. 2 seconds

c. 8 seconds The velocity changes from positive to negative meaning it begins to fall.

d. ≈ 11 seconds and falling at a rate of 90 ft/s

e. ≈ 3 seconds

f. Accelerated greatest at 2 seconds

Acceleration constant between 2 and 11 seconds