

4.1
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11. a) $h=0 \therefore 0 = -2d^2 + 3d + 10$

b) $2d^2 - 3d - 10 = 0$
 ~~$(2d - 5)(d + 2)$~~

$$y_1 = 2x^2 - 3x - 10$$

$$y_2 = 0$$

calc intersect

$$x = 3.1 \quad (-1.6 \text{ is extraneous})$$

$$d = 3.1 \text{ m}$$

12a) first

$$y_1 = -0.01x^2 + 0.84x$$

$$y_2 = 0$$

calc intersect

$$x = 0 \quad x = 84$$

second

$$y_1 = -0.01x^2 + 2.52x - 141.12$$

$$x = 84 \quad x = 168$$

third

$$y_1 = -0.01x^2 + 4.2x - 423.36$$

$$x = 168 \quad x = 252$$

b) the zeroes are where the supports reach the roadway

c) 252m

13. $x^2 + 6x + k = 0$

$$b^2 - 4ac$$
$$36 - 4k$$

a) $36 - 4k = 0$

$$4k = 36$$

$$k = 9$$

b) $36 - 4k > 0$

$$-4k > -36$$

$$k < 9$$

c) $36 - 4k < 0$

$$-4k < -36$$

$$k > 9$$

14. $4h^2 - 8hr + s^2 = 0$

a) $4h^2 - 320h + 4096 = 0$

$$h^2 - 80h + 1024 = 0$$

$$h = \frac{80 \pm \sqrt{80^2 - 4096}}{2}$$

$$h = \frac{80 \pm 48}{2}$$

$$h = 64 \text{ ft}$$

$$h = 64, 16$$

can't be 16
(less than radius)

15. Ultra $d = 1.5t^2$ Edison $d = 5.4t^2$

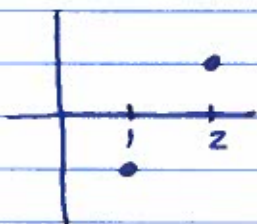
\uparrow
 $d = 1.5(5)^2$
 $d = 37.5$

\rightarrow $37.5 = 5.4t^2$
 $\frac{37.5}{5.4} = t^2$

$t = 2.6$

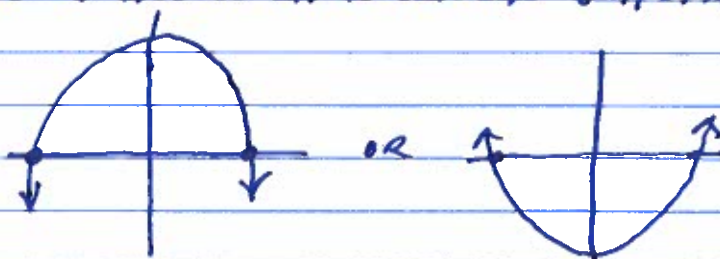
it takes 2.6 seconds so the Edison should start 2.4 seconds after the Ultra.

16.



to get from \ominus to \oplus the function must pass through zero so there must be a zero/root/x-intercept between 1 and 2 (could be more than one)

17. axis of symmetry if $(-4, 0)$ is an x-intercept $(4, 0)$ must be an x-intercept



18. x int $(6, 0)$ $(-2, 0)$

axis of symmetry is midpt. $(x = 2)$

for $y = x^2 - 4x - 12$ sub $x = 2$

$y = 4 - 8 - 12$

$y = -16$

$(2, -16)$