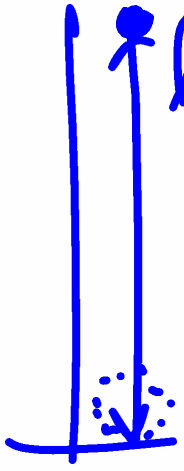
pg49 #b) On which planet will object move fastest when it hits the surface

Thu 20 Dec 2018

Ans: It'll be Neptune because it has the strongest gravitational force (acceleration)




$v_{surface} = g t_s$ ; $t_s \equiv$ "time it takes to hit the surface"

$0 = -\frac{1}{2} g t_s^2 + k$ } $\Rightarrow 0 = -\frac{1}{2} g t_s^2 + 100$

If $k = 100\,m$

Exercise: Calculate $t_s$ for Neptune.

Neptune: $g = 11.2\ m/s^2$

$$0 = -\frac{1}{2} \cdot 11.2 \cdot t_s^2 + 100 = -5.6 \cdot t_s^2 + 100$$

$$\Rightarrow +\frac{100}{5.6} = +\frac{5.6}{5.6} t_s^2$$

$$\Rightarrow t_s^2 = \frac{100}{56} \simeq 17.86 \Rightarrow \boxed{t_s = \sqrt{17.86} \simeq 4.2\,s}$$

c) On which planet will it move slowest?

Ans: Mars, because it has the weakest gravitational force (acceleration)

12) Describe how the differ from the base function $y = x^2$

a) $y = (x+7)^2$

Ans: translated 7 units left

b) $y = x^2 + 7$

Ans: translated 7 units up

c) $y = -2(x-4)^2$

d) $y = -\frac{1}{2}x^7 - 4$

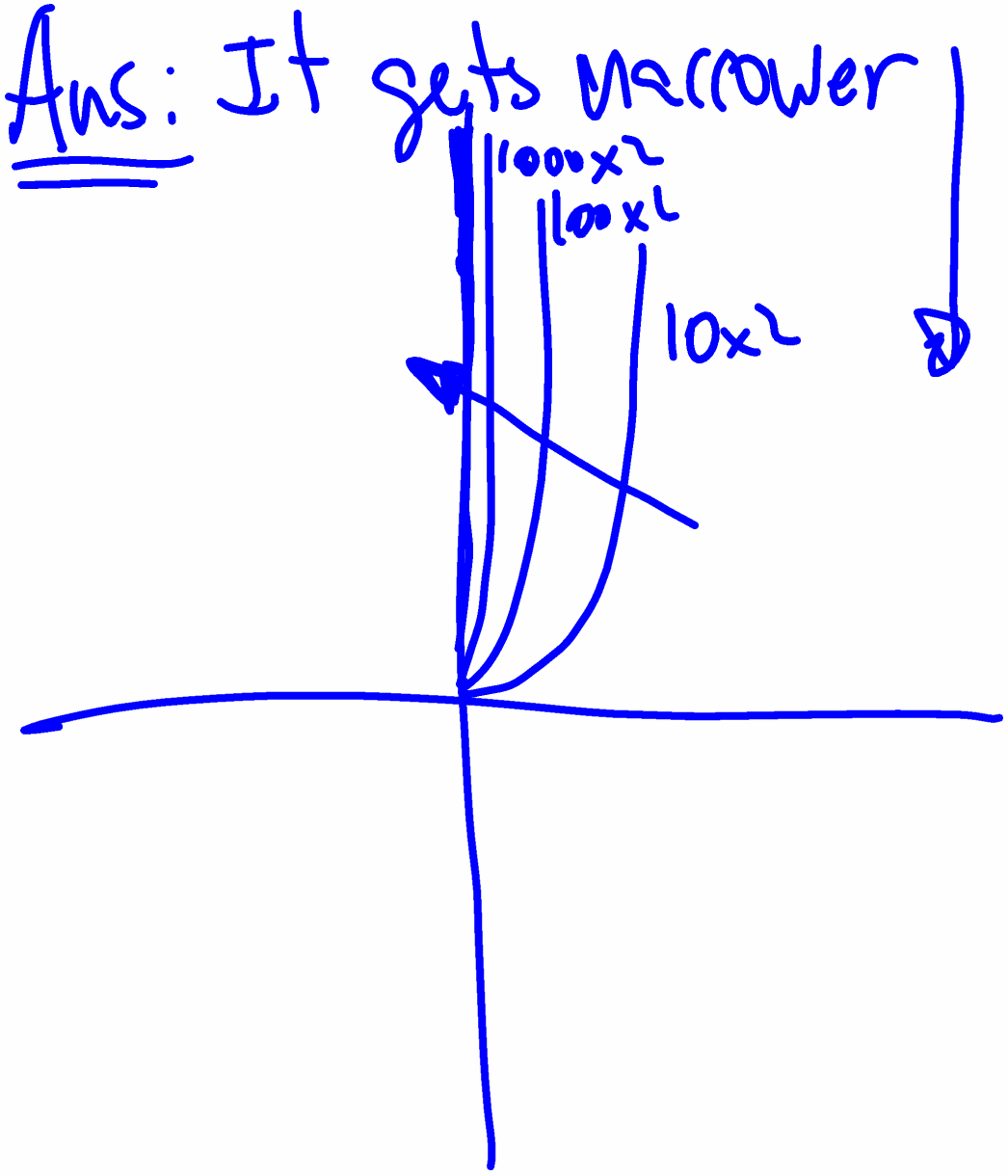
13) a) $f(x) = 10x^2$

$f(x) = 100x^2$

$f(x) = 1000x^2$

$f(x) = 10000x^2$

Ans: It gets narrower



13 b)

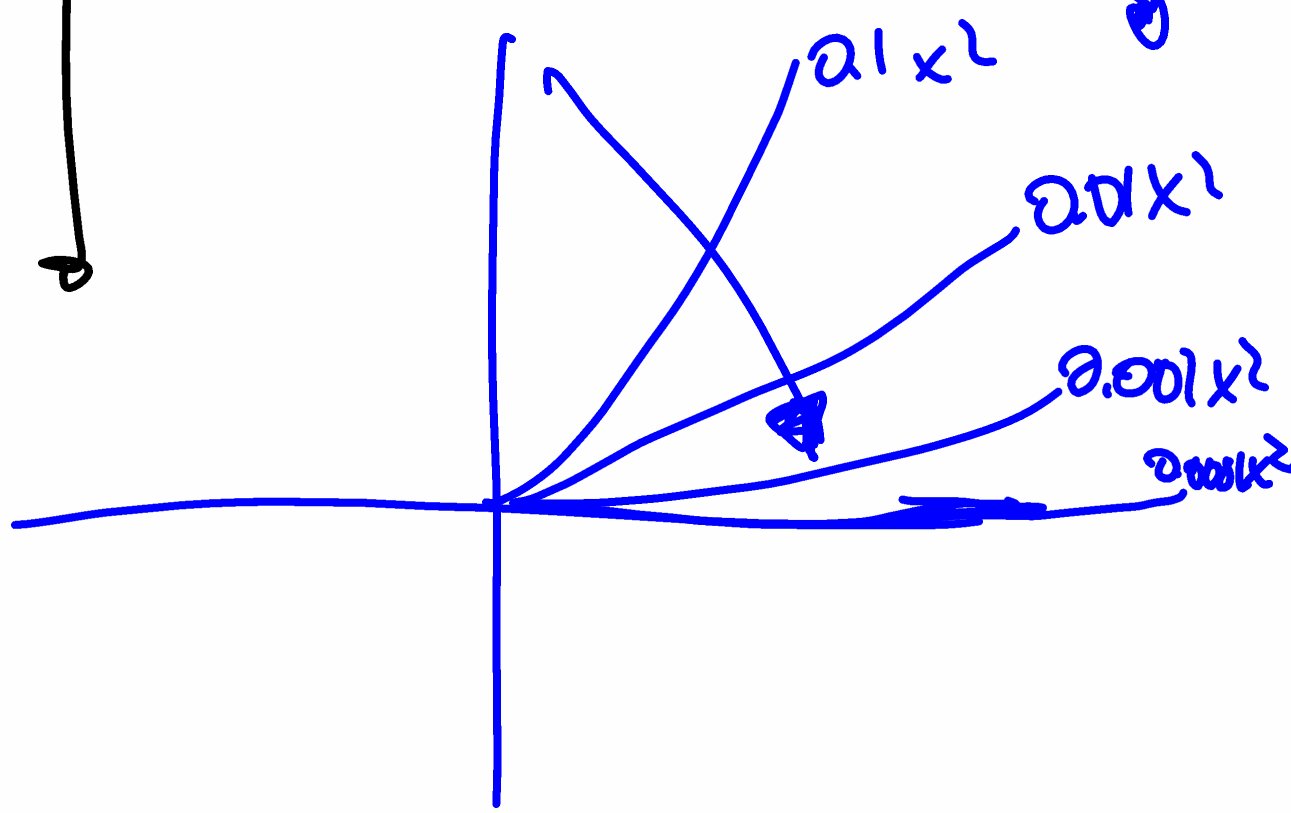
$f(x) = 0.1x^2$

$f(x) = 0.01x^2$

$f(x) = 0.001x^2$

$f(x) = 0.0001x^2$

Ans: It gets wider



(4) Write the equation for each parabola

a) $y = -x^2$

b) $y = -(x-2)^2$

c) $y = -(x-4)^2$

d) $y = -(x+2)^2$

e) $y = -(x+4)^2$