

11.5 p.705

ex 8 $S = 6e^2$ for e

$$\sqrt{\frac{S}{6}} = \sqrt{\frac{6}{e^2}}$$

$$\pm \sqrt{\frac{S}{6}} = e$$

ex 12 $h^2 \cdot \frac{L}{1} = \frac{k d^4}{h^2} \cdot h^2$ for h

$$\frac{h^2 L}{L} = \frac{k d^4}{L}$$

$$\sqrt{h^2} = \sqrt{\frac{k d^4}{L}}$$

$$h = \pm \sqrt{\frac{k d^4}{L}} = \pm d^2 \sqrt{\frac{k}{L}}$$

ex 20 $p^2 = \sqrt{\frac{kl}{g}}$ for g

$$\frac{p^2}{1} = \frac{kl}{g}$$

$$\frac{p^2 g}{p^2} = \frac{kl}{p^2}$$

$$g = \frac{kl}{p^2}$$

ex 30



$a^2 + b^2 = c^2$
hypotenuse

$$\begin{aligned} & (2m+3)(2m+3) \\ & 4m^2 + 6m + 6m + 9 \\ & 4m^2 + 12m + 9 \end{aligned}$$

$$\begin{aligned} (2m)^2 + (2m+3)^2 &= (5m)^2 \\ 4m^2 + 4m^2 + 12m + 9 &= 25m^2 \\ 8m^2 + 12m + 9 &= 25m^2 \\ -8m^2 - 12m - 9 & \quad -8m^2 \end{aligned}$$

$$\begin{aligned} 0 &= 17m^2 - 12m - 9 \\ A &= 17 \quad B = -12 \quad C = -9 \end{aligned}$$

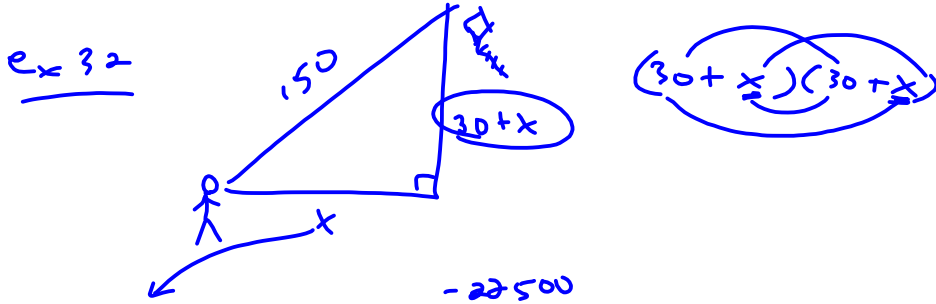
$$m = \frac{12 \pm \sqrt{144 + 612}}{34} = \frac{12 \pm \sqrt{756}}{34} = \frac{12 \pm 27.5}{34}$$

1.161
1.16 ≈ 1.2

-0.45 ≈ -0.5

↑
ignore
(neg. distance)

27.4955
5(1.161) = 5.8
5(1.2) = 6
2(1.2) = 2.4 2(1.161) = 2.3
2(1.2)+3 = 5.4 2(1.161)+3 = 5.3



$$x^2 + x^2 + 60x + 900 = 22500$$

$$\frac{2x^2}{2} + \frac{60x}{2} - \frac{21600}{2} = 0$$

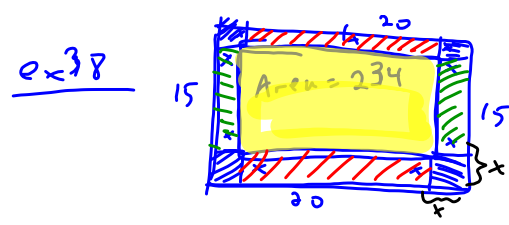
-100 · 108
-90 · 120

$$x^2 + 30x - 10800 = 0$$

$$(x - 90)(x + 120) = 0$$

$x = 90$ $x = -120$
ignore

$x + 30 = 120$ ft high



strip = whole room - rug

$$4x^2 + 2x(20-2x) + 2x(15-2x) = (15)(20) - 234$$

$$70x - 4x^2 = 66$$

$$0 = 4x^2 - 70x + 66$$

$$0 = 2x^2 - 35x + 33$$

$$0 = (2x - 33)(x - 1)$$

$2x = 33$ $x = 1$ ft wide all around the room
 $x = 16\frac{1}{2}$
ignore

ex 48 $D(t) = 13t^2 - 73t$ find t
if $D(t) = 218$
ft

$$218 = 13t^2 - 73t$$

$$0 = 13t^2 - 73t - 218$$

$$t = \frac{73 \pm \sqrt{5329 + 11336}}{26} = \frac{73 \pm \sqrt{16665}}{26}$$

$$\frac{73 \pm 129.09}{26} = \frac{202.09}{26} = 7.772 \text{ sec.}$$

ex 54 $A = P(1+r)^2$

$$\frac{10920.25}{10000} = \frac{10000(1+r)^2}{10000}$$

$$\sqrt{1.092025} = \sqrt{(1+r)^2}$$

$$\cancel{1}.045 = \cancel{1} + r$$

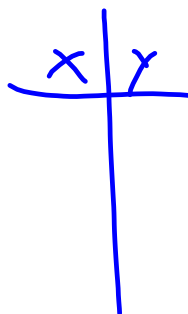
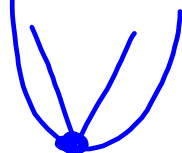
$$.045 = r$$

4.5% rate

11.6 axis of symmetry

$$x = \frac{-B}{2A}$$

vertex $\left(\frac{-B}{2A}, \right)$



ex 4 $f(x) = \frac{1}{2}x^2 + 0x + 0$

$$\frac{-B}{2A}$$

vertex $(0, 0)$

$$\frac{1}{2}(0)^2 = 0$$

ex 6 $f(x) = x^2 - 4 = (x - 0)^2 - 4$

$$A = 1 \quad B = 0 \quad C = -4$$

$$\frac{-B}{2A}$$

Vertex: $(\underline{0}, \underline{-4})$

$$0^2 - 4$$

ex 8 $f(x) = (x + 3)^2 + 0$

$$= (x + 3)(x + 3)$$

$$= x^2 + 6x + 9$$

$$A = 1 \quad B = 6 \quad C = 9$$

$$\frac{-B}{2A} = \frac{-6}{2 \cdot 1} = -3$$

Vertex $(\underline{-3}, \underline{0})$

ex 10

$$f(x) = (x+5)^2 - 8$$

$$= (x+5)(x+5) - 8$$

$$= x^2 + 10x + 25 - 8$$

$$= x^2 + 10x + 17$$

$$\frac{-B}{2A} = \frac{-10}{2 \cdot 1} = -5$$

Vertex $(-5, -8)$


$$f(x) = Ax^2 + Bx + C$$


$$\text{Vertex} \left(\frac{-B}{2A}, \underline{f\left(\frac{-B}{2A}\right)} \right)$$


$$f(x) = a(x-h)^2 + k$$

Vertex (h, k) $|a| < 1$
wider $|a| > 1$
narroweras $a \rightarrow \infty$ $\cup \rightarrow$ narrower $+a$ \cup $-a$ \cap

ex 12 $f(x) = -\underline{(x-2)}^2 + \underline{1}$
 $V(2, 1)$

ex 14 $f(x) = -2x^2$ 
narrower

ex 16 $f(x) = \frac{2}{3}x^2 - 4$ 
↑ positive
wider

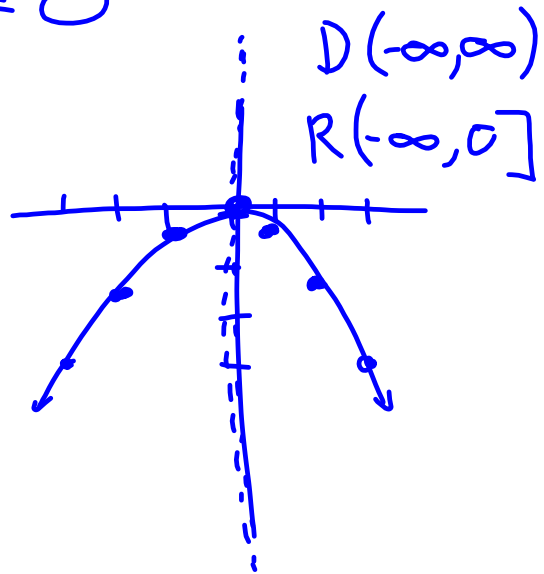
ex 18 $f(x) = -\frac{1}{3}(x+6)^2 + 3$
 wider

ex 22 $f(x) = -\frac{1}{2}x^2 + 0x \curvearrowright$ wide

axis: $x = \frac{-B}{2A} = 0$

$V(0, 0)$

x	y
-1	-1/2
2	-2
3	-3/2
	-3



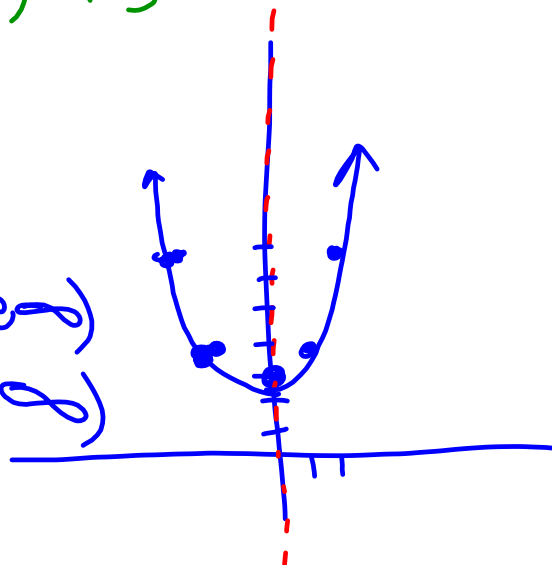
ex 24 $f(x) = x^2 + 3$ \curvearrowright
 $= (x+0)^2 + 3$

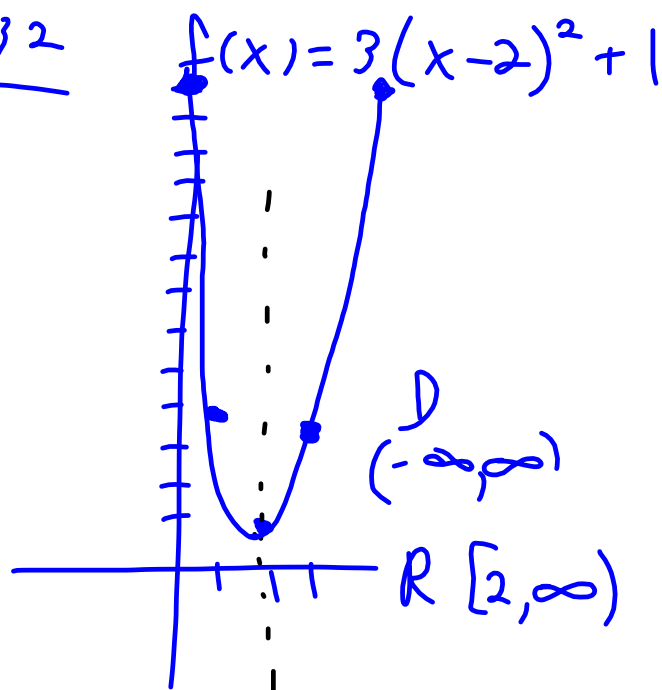
axis: $x = 0$

$V(0, 3)$

x	y
-1	4
2	7
3	12

$D(-\infty, \infty)$
 $R = [3, \infty)$



0x32

↻ ↻
 axis $x=2$
 $V(2, 1)$

x	y
0	13
1	4