Now complete pp.146-148 #1, 2a, 4b, 6be, 8ab, 9ab, 10d, 13a, 16*
* for 16b you will need to use DESMOS

p.148

13. a) Determine the quadratic function that has zeros at -3 and -5, if $f(7) = -720$.

use $(7,-720)$

$y=a(x+3)(x+5)$

$(-720)=a(7+3)(7+5)$

$-720=a(10)(12)$

$-720=120a$

$a=-6$

$\therefore y=-6(x+3)(x+5)$ is the equation.

$y=a(x-r)(x-s)$

$x=-3$

$x+3=0$

$(x+3)$

16. Square corners cut from a 30 cm by 20 cm piece of cardboard create a box when the 4 remaining tabs are folded upwards. The volume of the box is $V(x) = x(30 - 2x)(20 - 2x)$, where x represents the height.

a) Calculate the volume of a box with a height of 2 cm.
b) Calculate the dimensions of a box with a volume of 1000 cm^3.
c) Solve $V(x) > 0$, and discuss the meaning of your solution in the context of the question.
d) State the restrictions in the context of the question.

a) $V(2)=2(30-2(2))(20-2(2))$

$=2(26)(16)$

$=832 \text{ cm}^3$

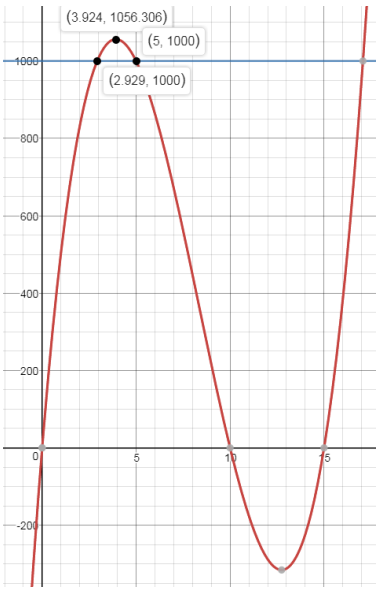
b) if $V(x)=1000$ ← DESMOS →

$1000=x(30-2x)(20-2x)$

↳ using desmos

$x=2.922$ or $x=5$

Produces a volume of 1000 cm^3



c) $V(x)>0$

$(0,10)$

d) Restrictions $0 \le x \le 10$

at $x=0$ and $x=10$ the volume is 0, because one of the 3 dimensions is 0.

x can not be >10, because you can't cut the paper past the $\frac{1}{2}$-way point.

3.4 Transformations of Cubic and Quartic Functions

Math Learning Target:
"I can describe and perform transformations on the parent functions $y = x^3$ and $y = x^4$."

Recall: $y = f(x)$ may be transformed to $y = af[k(x-d)]+c$

Last class we learned how to sketch polynomial functions in **factored form.** However, if the polynomial function is in the form $y = a[k(x-d)]^n + c$, where $a \neq 0, c \neq 0, k \neq 0$ then it should be graphed by identifying and applying the transformations of the polynomial function $y = x^n$ where n is a nonnegative integer.

Today: Graphing $y = a[k(x-d)]^3 + c$ and $y = a[k(x-d)]^4 + c$

Ex.1

On the same plane, graph:

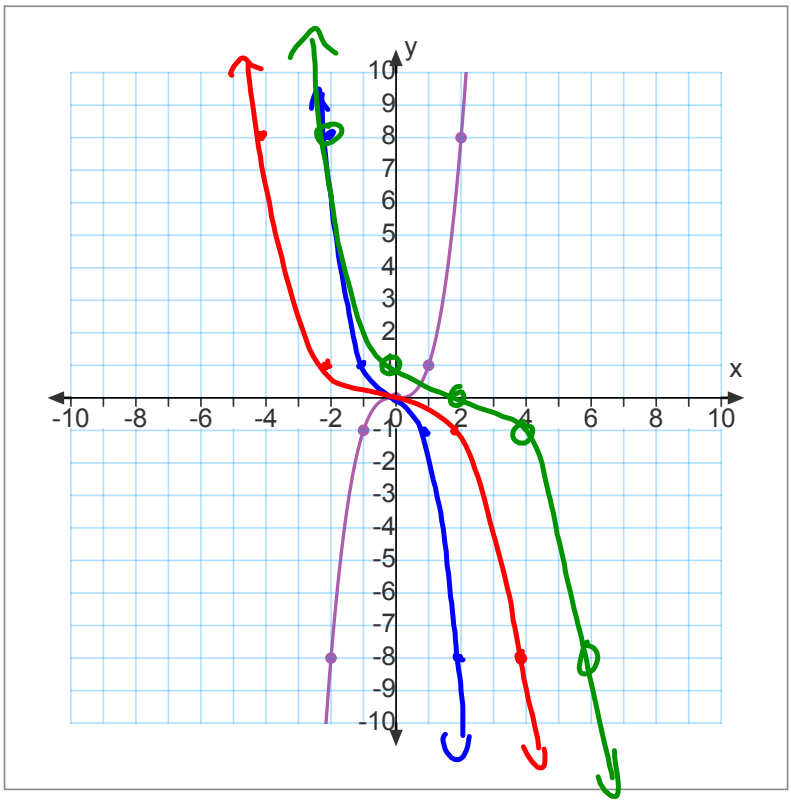
a) $y = x^3$

b) $y = -(\frac{1}{2}x - 1)^3$

$= -(\frac{1}{2}(x-2))^3$

RST

reflection in the x-axis
h.s. by factor of 2
h.t. 2 units right



Complete pp.155-158 #1, 2*, 3ab, 4bd, 5a, 6ab, 8**, 9af (*for #9 see Ex. 2 on p.153*), 10, 14

**2e has an incorrect answer in the back: change "left" to "right"*
**2f has an incorrect answer: ...horizontal translation 35 units left...*
***8 has an incorrect answer: it should be* (-2, -8); (0, 0) *then* (2, 8)