

In Exercises 1-4 (a) find the standard form of the equation, (b) find the x-intercepts, and (c) use this information to sketch a graph:

1. $f(x) = x^2 - 6x + 8$

a)
$$\begin{array}{|c|c|c|} \hline x & x-2 & \\ \hline x^2 & x^2-2x & \\ \hline - & -2x & +9 \\ \hline \end{array}$$

$$\rightarrow (x^2-6x+9)-9+8 = (x-3)^2-1$$

2. $x^2 - 2x - 15$

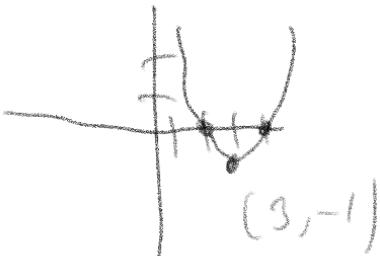
a)
$$\begin{array}{|c|c|c|} \hline x & x^2 & -x \\ \hline -1 & -x & +1 \\ \hline \end{array}$$

$$(x^2-2x-15)-(x^2-x)=-(x-1)^2-16$$

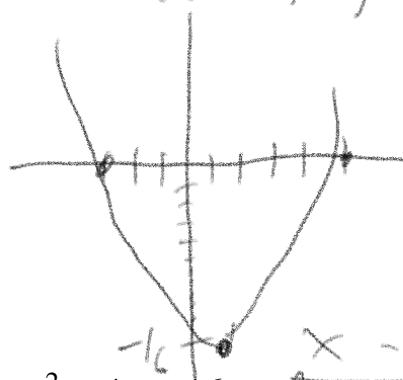
b) $(x-2)(x-4)=0, x=2, 4$

b) $(x+3)(x-5)=0, x=-3, 5$

c)



c)



3. $h(x) = 4x^2 + 32x + 64$

a) $= 4(x^2 + 8x + 16) + 4$
 $= 4(x+4)^2$

x $\begin{array}{|c|c|c|} \hline x^2 & +4x & \\ \hline +4x & +16 & \\ \hline \end{array}$

4. $m(x) = x^2 - 4x - 16$

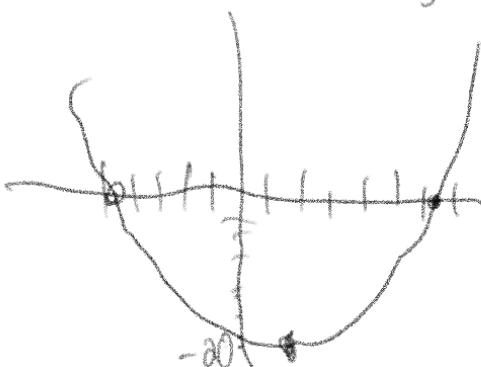
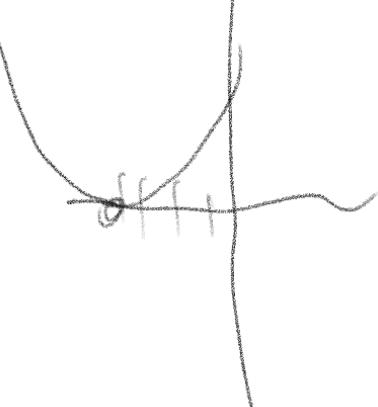
a) $= (x-2)^2 - 4 - 16 = (x-2)^2 - 20$

x $\begin{array}{|c|c|c|} \hline x^2 & -2x & \\ \hline -2 & -2x & +4 \\ \hline \end{array}$

b) $4(x+4)^2 = 0$
 $(x+4)^2 = 0$
 $x = -4$

b) $(x-2)^2 - 20 = 0$
 $(x-2)^2 = 20$

$x-2 = \pm\sqrt{20}, x = 2 \pm \sqrt{20}$



answer key

precalc
pset 5.3

Show all work
Do all work in your notebook

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5. For $f(x) = 2x^2$, $g(x) = x + 4$, (a) $f \circ g$, (b) $g \circ f$, and (c) try to find $(f \circ g)(0)$.

a) $f \circ g(x) = f(g(x)) = 2(g(x))^2 = 2(x+4)^2$

b) $(g \circ f)(x) = 2x^2 + 4$

c) $2(0+4)^2 = 32$

For (6) and (7) below, find two functions f and g such that $(f \circ g)(x) = h(x)$. There are many right answers, explain in a complete sentence why yours is correct:

one possibility:

6. $h(x) = \sqrt[3]{x^2 - 4}$

7. $h(x) = \frac{4}{(5x+3)^2}$

$f(x) = \sqrt[3]{x}$

$g(x) = x^2 - 4$

$f(x) = \frac{4}{x^2}$

$g(x) = 5x + 3$

answer key

precalc
pset 5.3

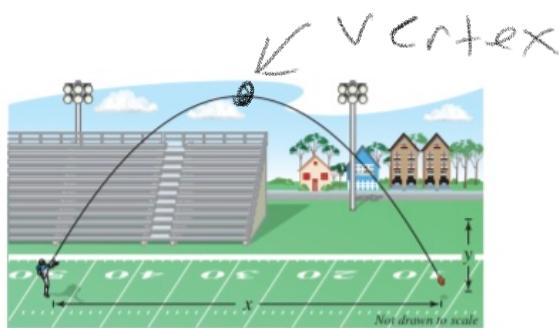
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8. The path of a football is given by

$$y = -0.08x^2 + 1.8x + 3$$

Use the *how to solve it* method and figure out how high the football gets. **Hint:** draw a graph!



- 1) we want to find the vertex
- 2) convert to vertex form!
- 3) a. factor out -0.08 :

$$\begin{aligned} -0.08[x^2 - 22.5x - 37.5] &= \\ \begin{array}{|c|c|} \hline x^2 & -11.25x \\ \hline -11.25x & 126.56 \\ \hline \end{array} & -0.08[(x^2 - 22.5x + 126.56) - 126.56] \\ & = -0.08[(x - 11.25)^2 - 164.06] \\ & \approx -0.08(x - 11.25)^2 + 13.12 \end{aligned}$$

Vertex: $(11.25, 13.12)$

- 4) go over your work.

Does your answer
seem reasonable?