$$
\begin{array}{ll}
y=x^{2}-9 & 25 n^{2}-1 \\
(x)(3) & (5 n)^{2} \cdots(1)^{2} \\
y=(x+3)(x-3) 3) & (5 n+1)(5 n-1)
\end{array}
$$

Do the Warm Up
front side only
also pick up the ch. 2 test info sheet

Example: $9 x^{2}-4=(3 x+2)(3 x-2)$

1. $4 x^{2}-1=$
2. $x^{2}-9=$
(3.) $36 x^{2}-9=9\left(4 x^{2}-1\right)$ $9(x)$
3. $100 x^{2}-81=$
4. $25 x^{2}-4=$
5. $81 x^{2}-121=$

| $\begin{gathered} (x+13)(x-13) \\ \text { THE } \end{gathered}$ | $\left\lvert\, \begin{gathered} 16(3 x-1)(3 x-1) \\ \text { SUM } \end{gathered}\right.$ | $\begin{gathered} (x-4)(x+4) \\ \text { OFA } \end{gathered}$ | $\begin{gathered} (6 x+5)(6 x-5) \\ \text { PRO } \\ \hline \end{gathered}$ | $\begin{gathered} (25-4 x)(25+4 x) \\ Q \cup O \\ \hline \end{gathered}$ | $\begin{gathered} (x+1)(x-1) \\ \text { DUC } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} (9+x)(9-x) \\ \text { TOF } \end{gathered}$ | $\begin{gathered} 9(2 x-1)(2 x+1) \\ \text { TIE } \end{gathered}$ | $(x+7)(x-7)$ <br> THE | $\begin{gathered} (2 x+1)(2 x-1) \\ \text { NIA } \end{gathered}$ | $\begin{gathered} (9 x+1)(9 x-1) \\ \text { SUM } \\ \hline \end{gathered}$ | $\begin{gathered} (x+2)(x-2) \\ \text { AND } \end{gathered}$ |
| $\begin{gathered} (10-x)(10+x) \\ \text { WAS } \\ \hline \end{gathered}$ | $\begin{gathered} (5 x+3)(5 x-3) \\ \text { DIF } \end{gathered}$ | $\begin{gathered} (x-5)(x+5) \\ \text { HAS } \end{gathered}$ | $\begin{gathered} (8 x+1)(8 x-1) \\ \text { FER } \end{gathered}$ | $\begin{gathered} (11 x-7)(11 x+7) \\ \text { MAN } \end{gathered}$ | $\begin{gathered} (x-6)(x+6) \\ \text { NER } \end{gathered}$ |
| $\begin{gathered} (x+18)(x-18) \\ \text { ENC } \\ \hline \end{gathered}$ | $\begin{gathered} (10 x-9)(10 x+9) \\ \text { THA } \end{gathered}$ | $\begin{gathered} (x-3)(x+3) \\ T \\| S \end{gathered}$ | $(5 x-2)(5 x+2)$ <br> MYP | $\begin{gathered} (7 x+11)(7 x-11) \\ \text { EOF } \\ \hline \end{gathered}$ | $\begin{gathered} (x+8)(x-8) \\ \text { THE } \\ \hline \end{gathered}$ |
| $\begin{gathered} (x+15)(x-15) \\ \text { SQU } \end{gathered}$ | $\left\{\begin{array}{c} (9 x-11)(9 x+11) \\ \text { ROB } \end{array}\right.$ | $(x+9)(x-9)$ <br> ARE | $\begin{gathered} (3 x+2)(3 x-2) \\ \text { ROO } \end{gathered}$ | $(7 x-4)(7 x+4)$ <br> LEM | $(x+9)(x-9)$ <br> TS. |

15. The factored form of the difference of the two squares is
16. $x^{2}-16=$
17. $144 x^{2}-16=$
18. $x^{2}-25=$
19. $625-16 x^{2}=$
20. $100-x^{2}=$
21. $x^{2}-36=$
22. $121 x^{2}-49=(11 x+)^{2}$
$(11 x)^{2}-(7)^{2}$

Consolidate understanding of parent graphs and
the details of their
transformations.
Aim
d learn Characteristics of each parent function

## Class Brainstorm

List of all of the families of functions that you have learned about so far in your study of Algebra

## brainstorm

 parabolas exponential cubicabsolute value
square root
linear
hyperbola(recirocal)

lines parabolas hyperbolas cubics square root exponential absolute value





## Function Familiarity

2. $y=\frac{1}{x+2}$
$y=x^{2}-5$
b.

$$
y=\frac{1}{(x)}
$$


$y=x^{2}$
$y=(x-3)^{3}$
c.


| d. $\begin{gathered} y=(5-3)^{x} \\ y=b^{x} z^{x} \end{gathered}$ | e. $\quad y_{y}=3 \times 1$ $y=-3 x-6$ |  |
| :---: | :---: | :---: |

$y=(x+3)^{2}-6$

$y=-(x-3)^{2}+6$
h.

$y=(x+3)^{3}-$
i.


## let's go back and look at the

 Significance of (h,k)$y=-(x-3)^{2}+6$


Parabola

$y=a(x-h)^{2}+k$
The locator point ( h, k ) is at the vertex of a parabola
$(h, k) \quad(-2,3)$ infection

$$
y=(x+2)^{\frac{3}{3}}
$$

f.


## Cubic

$y=x^{3}$

$$
y=a(x-h)^{3}+k
$$

The locator point ( $h, k$ ) is at the inflection point.
$(-2,0)$ is the locator a. $y=\frac{1}{x+2}$ point


$$
y=\frac{1}{x}
$$

## Hyperbola

$y=\frac{1}{x}$
$y=\frac{a}{x-h}+k$
The locator point ( $h, k$ ) is in between the two branches.

$$
\begin{gathered}
(0,-2) \text { new y-int• } \\
y=2^{x}-3 \\
\text { d. } \\
y=2^{x} \\
y=a \cdot 2^{x}+k
\end{gathered}
$$



The locator point ( h, k )
is ?????

$$
\begin{aligned}
& y=|x| \\
& y=a|x-h|+k
\end{aligned}
$$



## Two Tough Problems

(1) Complete the square to convert $y=3 x^{2}+2 x+10$ to graphing

$$
\frac{y}{3}=
$$


(2) Solve the equation

$$
2\left(1-\frac{x}{3}\right)=\frac{x}{7}+3
$$

(2) Solve the equation

$$
2\left(1-\frac{x}{3}\right)=\frac{x}{7}+3
$$



## 2-107-109, 110a, 111, 113, 119 <br> The Chapler 2 lest is Friday

