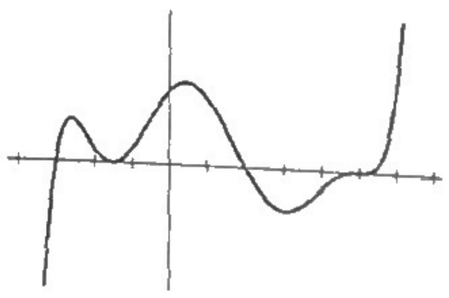
#10 D Pre-Calculus Worksheet
WS Section 2.6 Day One Graphing Rational Fuctions

Name: Key Per _____

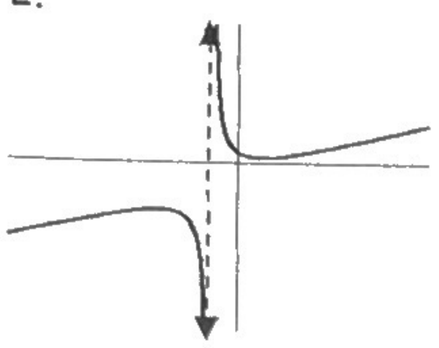
Are the following functions continuous or discontinuous?

1.

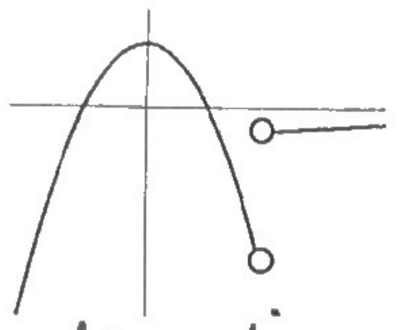


continuous

2.

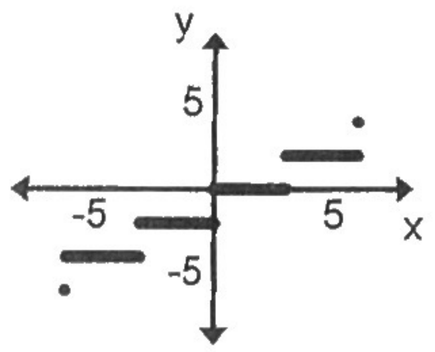


3.



discontinuous

4.



Identify the type and place of any discontinuities.

4. $f(x)=\dfrac{4x^2-9}{2x+3}$

$f(x)=\dfrac{(2x+3)(2x-3)}{(2x+3)}$

$f(x)=2x-3$

Discontinuity: hole (point)
Hole: $(-\frac{3}{2},-6)$ VA: No
HA: NO SA: NO
x-int: $\frac{3}{2}$ y-int: -3

5. $f(x)=\begin{cases}x^2+1, & x\le 1\\ -2x+3, & x>1\end{cases}$

Discontinuity: _____
Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

6. $f(x)=\dfrac{4}{x^2-5x-6}$

$f(x)=\dfrac{4}{(x-6)(x+1)}$

Discontinuity: asymptote
Hole: NO VA: $x=6$ and $x=-1$
HA: $y=0$ SA: NO
x-int: None y-int: $-\frac{2}{3}$

7. $f(x)=\dfrac{2x+7}{4}$

Discontinuity: _____
Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

8. $f(x)=\dfrac{2x+1}{2x^2-9x-5}$ $\quad \frac{-10}{-10}\ \frac{1}{2}$

$f(x)=\dfrac{(2x+1)}{(x-5)(2x+1)}$

$f(x)=\dfrac{1}{x-5}$

Discontinuity: hole and asymp.
Hole: $(-\frac{1}{2},-\frac{2}{11})$ VA: $x=5$
HA: $y=0$ SA: NONE
x-int: None y-int: $-\frac{1}{5}$

9. $f(x)=\dfrac{-5}{x^2+9}$

Discontinuity: _____
Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

10. $f(x)=\dfrac{x^2-4x-12}{x+2}$

$f(x)=\dfrac{(x-6)(x+2)}{x\neq 2}$

$f(x)=x-6$

Discontinuity: hole
Hole: $(-2,-8)$ VA: NO
HA: NO SA: NO
x-int: 6 y-int: -6

11. $f(x)=\dfrac{4x^2+16x+15}{2x-1}$

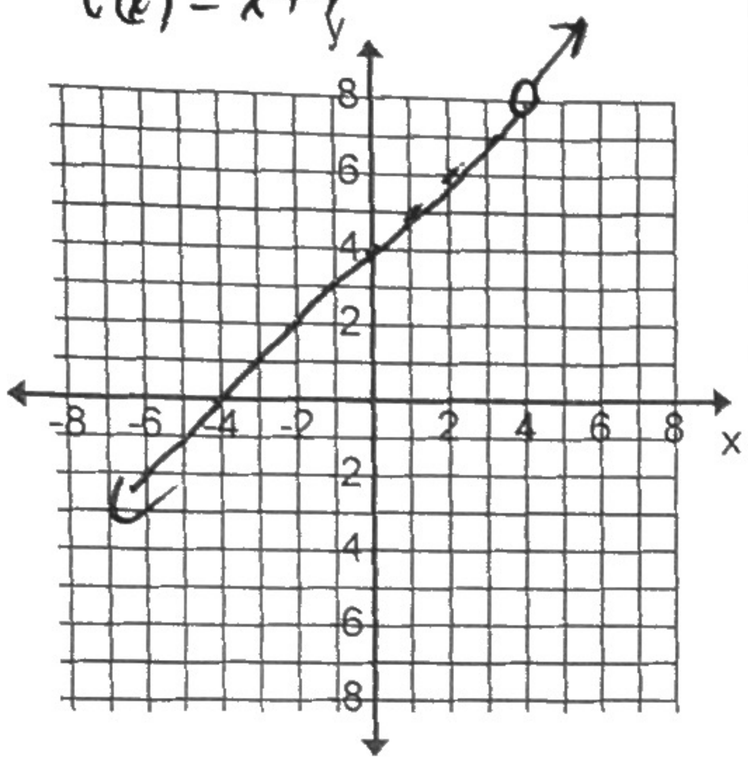
Discontinuity: _____
Hole: _____ VA: _____
HA: _____ SA: _____
x-int: _____ y-int: _____

Graph each function. Identify whether continuous or discontinuous. Give the type and place of any discontinuities.

12. $f(x)=\dfrac{x^2-16}{x-4}$

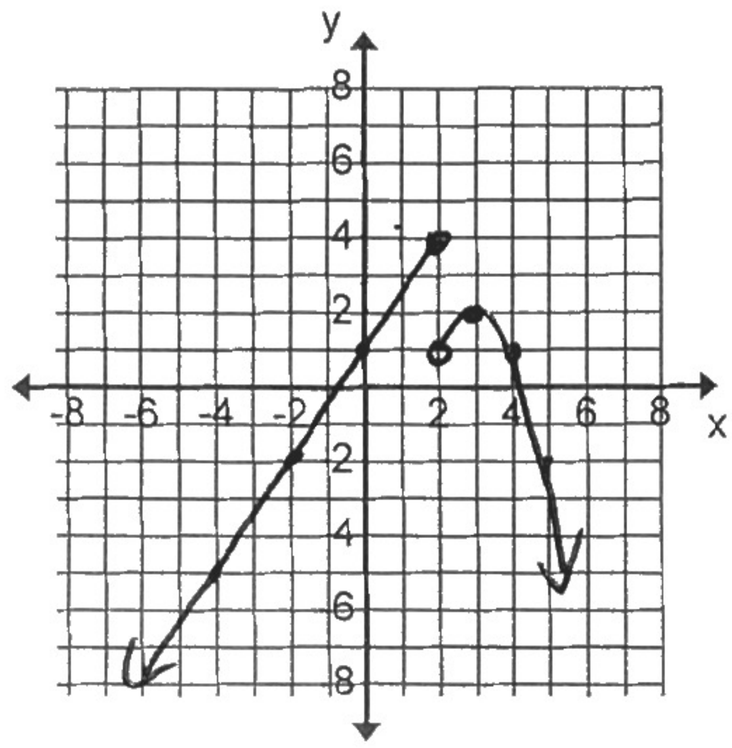
$f(x)=\dfrac{(x+4)(x-4)}{(x-4)}$

$f(x)=x+4$



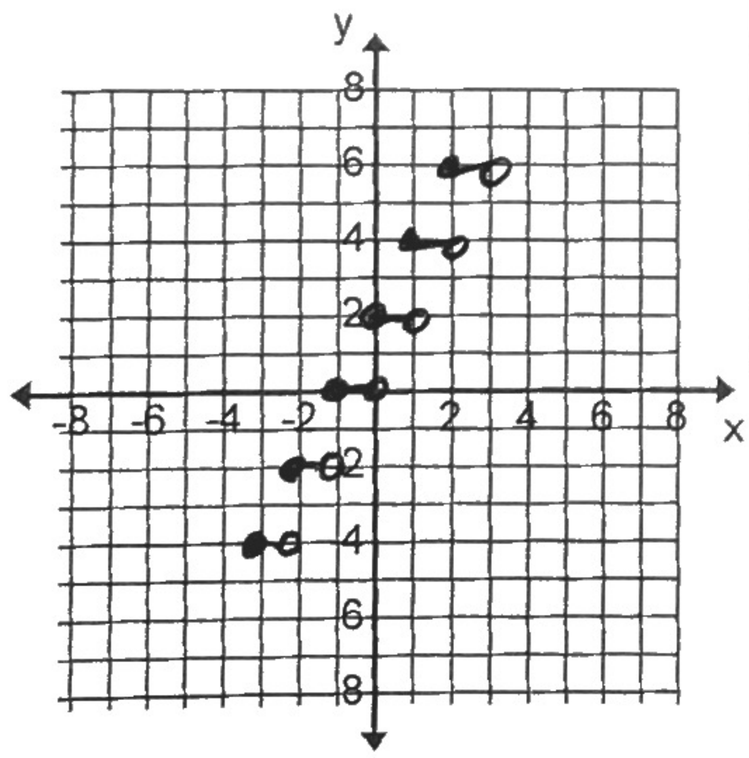
Hole: (4,8)
VA: NO
HA: NO
SA: NO
x-int: -4
y-int: 4
Type Discont.: hole

13. $f(x)=\begin{cases}\dfrac{3}{2}x+1, & x\le 2\\ -(x-3)^2+2, & x>2\end{cases}$



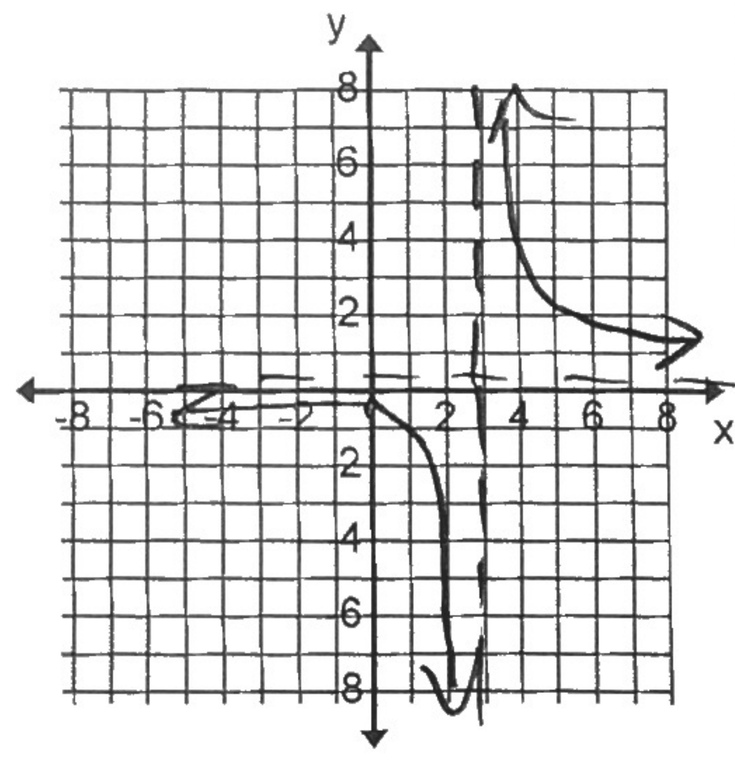
Hole:____
VA:____
HA:____
SA:____
x-int:____
y-int:____
Type Discont.:

14. $f(x)=2[\![x+1]\!]$



Hole: NO
VA: NO
HA: NO
SA: NO
x-int: [-1,0)
y-int: 2
Type Discont.: jump.

15. $f(x)=\dfrac{1}{x-3}$



Hole:____
VA:____
HA:____
SA:____
x-int:____
y-int:____
Type Discont.:

SOLVE EACH:

16. $\dfrac{3}{x}+\dfrac{2}{x+1}=\dfrac{23}{x^2+x}$ $\quad x(x+1)$

$x(x+1)$

$3(x+1)+2x=23$

$3x+3+2x=23$

$5x=20$

$x=4$

17. $x+4\sqrt{x}-21=0$

$\pm\sqrt{3}$, #

18. $5+\sqrt{x+7}=x$

$\left(\sqrt{x+7}\right)^2=(x-5)^2$

$x+7=x^2-10x+25$

$0=x^2-11x+18$

$0=(x-2)(x-9)$

$x=2$ or 9

$5+\sqrt{2+7}=2$

$5+3=2$

$8\neq 2$

$5+\sqrt{9+7}=9$

$5+4=9$

$9=9$ ✓