

Notes: Unit Circle/Piece-Wise Functions

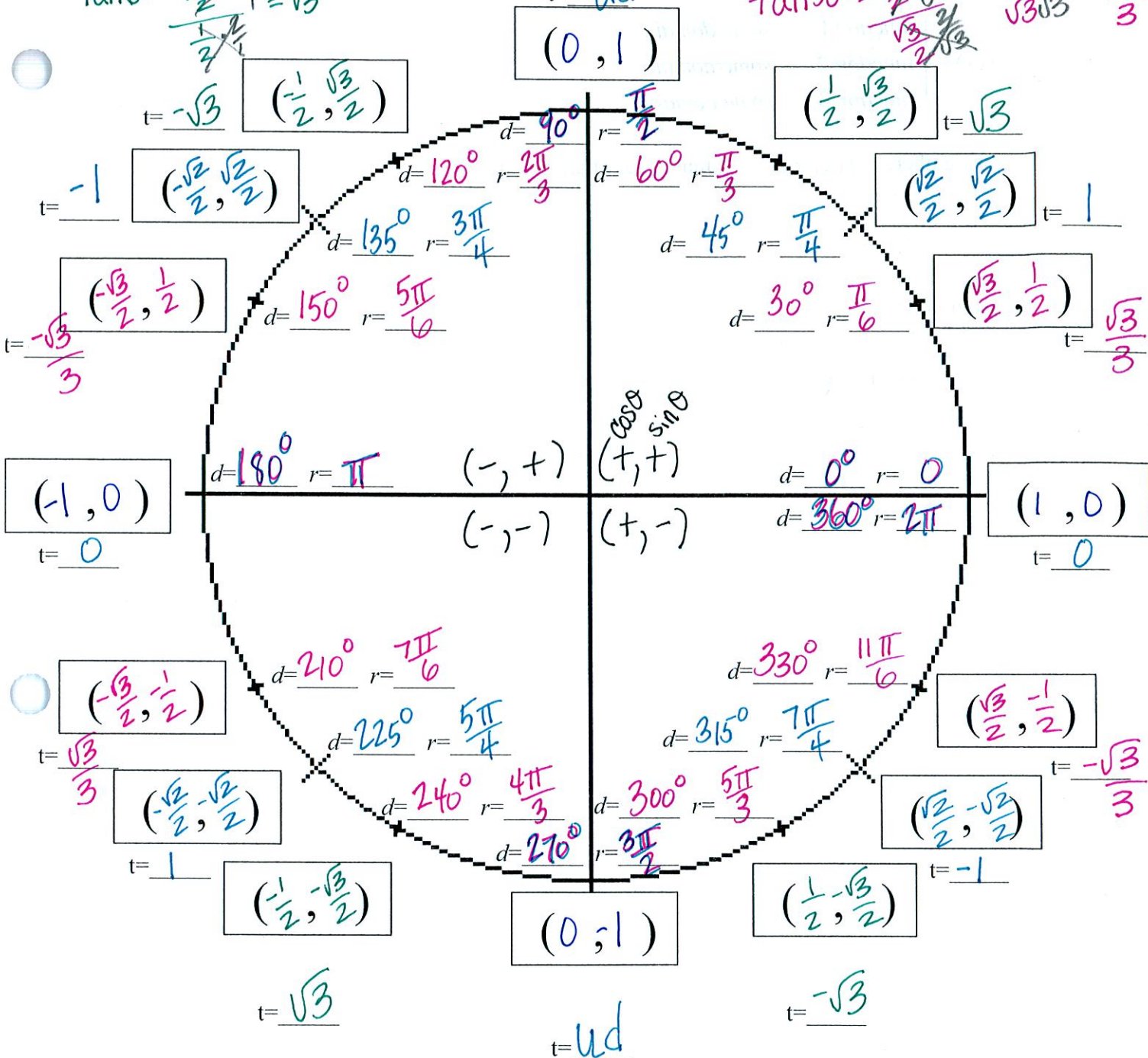
Day 1 $\tan 60^\circ = \frac{\sqrt{3}}{1} = \sqrt{3}$

Unit Circle

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

Name _____

$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{1\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{\sqrt{3}}{3}$



Reciprocal Identities

$$\frac{1}{\sin \theta} = \csc \theta \quad \frac{1}{\cos \theta} = \sec \theta \quad \frac{1}{\tan \theta} = \cot \theta$$

$$\frac{1}{\csc \theta} = \sin \theta \quad \frac{1}{\sec \theta} = \cos \theta \quad \frac{1}{\cot \theta} = \tan \theta$$

Tangent & Cotangent Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta} \quad \cot \theta = \frac{\cos \theta}{\sin \theta}$$

Pythagorean Identities

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

Double-Angle Formula

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

Graphing Piece-Wise Functions

$$f(x) = \begin{cases} \text{function 1} & \text{some domain} \\ \text{function 2} & \text{some domain} \\ \text{function 3} & \text{some domain} \end{cases}$$

Remember... $f(x) = y$ domain: set of all x -values

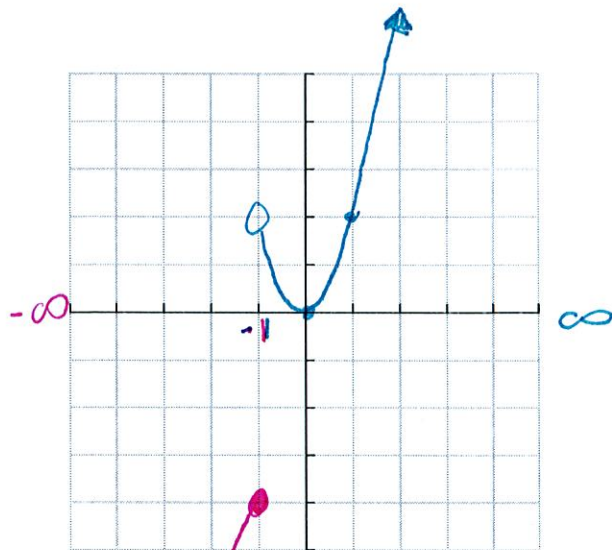
Domain x	Function y

Example 1:

$$f(x) = \begin{cases} 2x^2 & x > -1 \\ 3x-1 & x \leq -1 \end{cases}$$

$x > -1$	$2x^2$
-1	2
0	0
1	2
2	8
...	...

$x \leq -1$	$3x-1$
-1	-4
-2	-7
-3	-10
...	...



Example 2:

$$g(x) = \begin{cases} \frac{1}{2}x & x < -2 \\ 3 & -2 \leq x \leq 1 \\ x^2 & x > 1 \end{cases}$$

$x < -2$	$\frac{1}{2}x$
-2	-1
-4	-2
-6	-3
-8	-4
...	...

$-2 \leq x \leq 1$	3
-2	3
-1	3
0	3
1	3

$x > 1$	x^2
1	1
2	4
3	9
4	16
...	...

