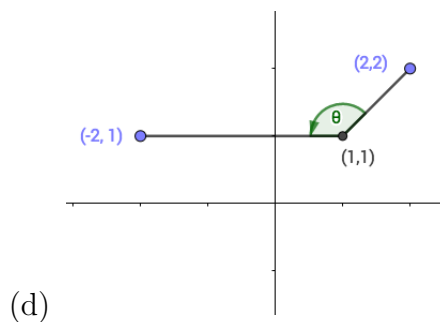
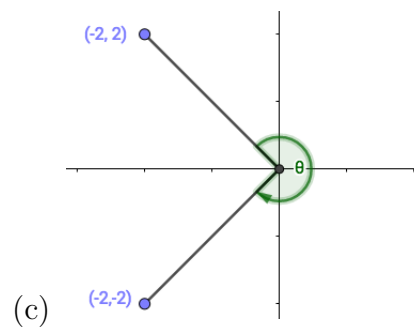
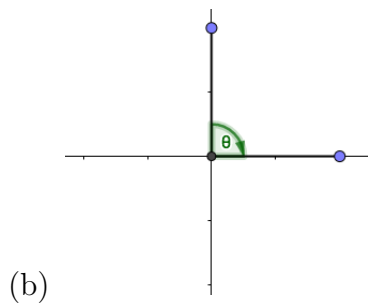
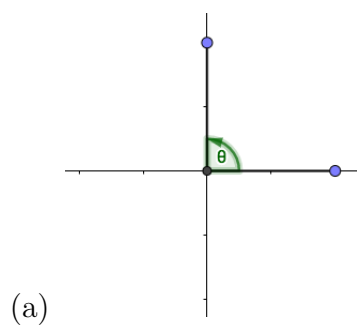


## Notesheet. Section 12.1: Measurement of angles

## Math 1220

**Definition 1.** What is an *angle*? What are the *initial ray*, *terminal ray*, and *vertex* associated with the angle?

**Challenge 2.** For each drawing, identify the angle  $\theta$  in degrees. Then create your own drawing for the angles  $\alpha = 180^\circ$  and  $\beta = -1^\circ$ .



**Definition 3.** What is the *unit circle*, what is *arc length*, and what are *radians*?

**Challenge 4.** For the previous challenge, write down each angle in radians. Then create your own drawing for the angles  $\theta = \frac{\pi}{2}$ ,  $\phi = -\pi$ , and  $\psi = 1$ . (Remember that a circle with radius 1 had a circumference of  $2\pi$ .)

**Theorem 5** (Converting between degrees and radians).

**Challenge 6.** Can you convert the angles  $\alpha = 0^\circ$ ,  $\beta = 270^\circ$ , and  $\gamma = -60^\circ$  into radians? Can you convert the angles  $\theta = \frac{\pi}{2}$ ,  $\phi = -\pi$ , and  $\psi = 1$  into degrees?