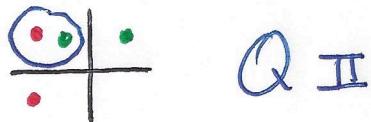


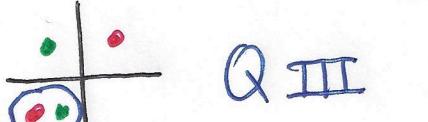
For #15, I use the A-S-T-C chart, showing which functions (sine, cosine, tangent) are positive

15. Based on the given information, in which quadrant does θ terminate.

a) $\sec \theta < 0$ and $\sin \theta > 0$

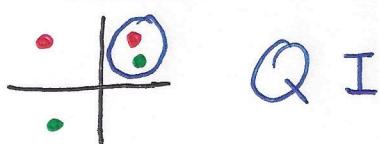


b) $\tan \theta > 0$ and $\cos \theta < 0$

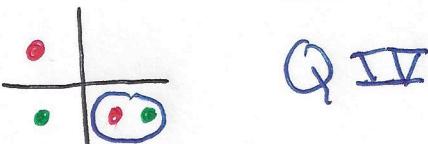


S $\sin \theta$ (csc θ)	A all fcns.
T	C
$\tan \theta$ (cot θ)	$\cos \theta$ (Sec θ)

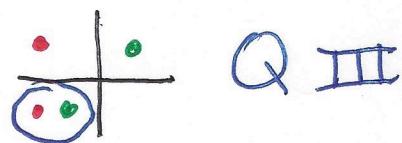
c) $\csc \theta > 0$ and $\tan \theta > 0$



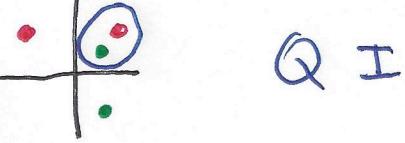
d) $\tan \theta < 0$ and $\sin \theta < 0$



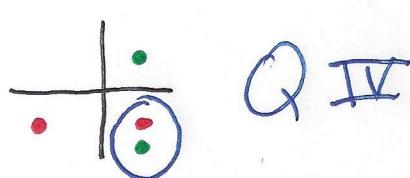
e) $\cos \theta < 0$ and $\cot \theta > 0$



f) $\csc \theta > 0$ and $\sec \theta > 0$



g) $\sin \theta < 0$ and $\sec \theta > 0$

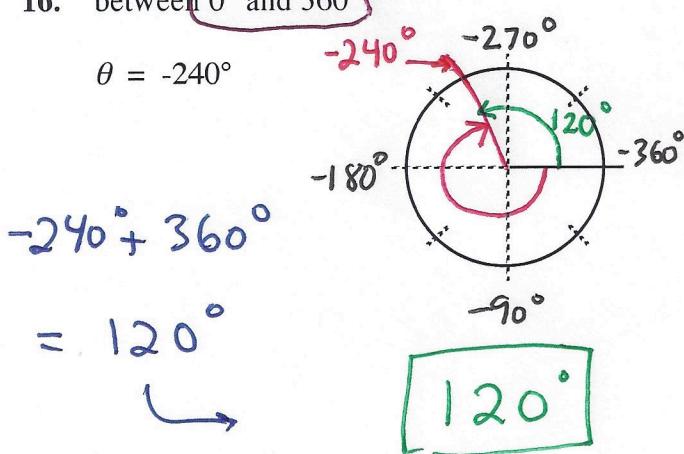


h) $\cot \theta < 0$ and $\cos \theta < 0$

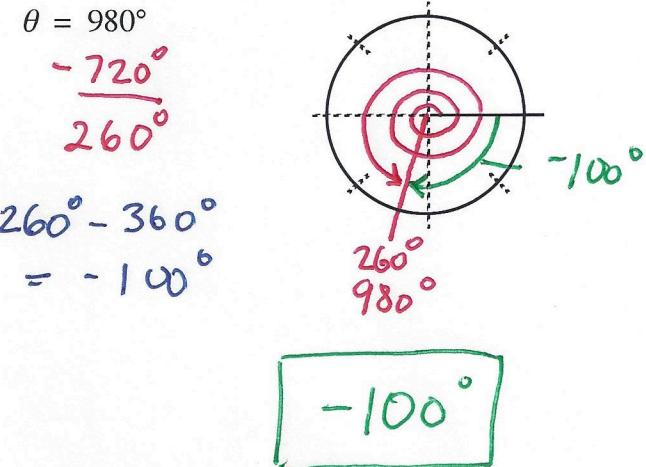


For each given angle measure, (i) locate it in a circle using standard position, and (ii) identify an angle that is coterminal with it and ...

16. between 0° and 360°



17. between 0° and -360°



Locate the given point in the x - y -plane, and draw a positive angle θ whose terminal side contains the point. Then, find the values of the six trig functions of θ and simplify.

18. $(3, -\sqrt{7})$ ← this point is in QIV
 $\sqrt{7} \approx 2.6$

$$\sin \theta = \frac{y}{r} = \frac{-\sqrt{7}}{4}$$

$$\cos \theta = \frac{x}{r} = \frac{3}{4}$$

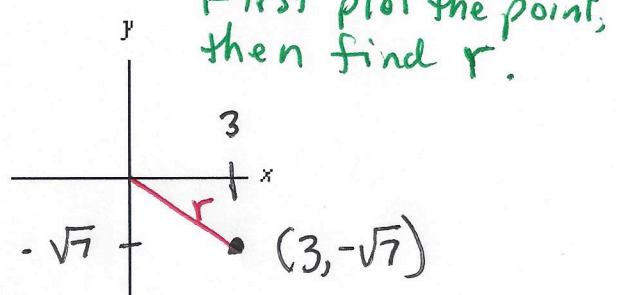
$$\tan \theta = \frac{y}{x} = \frac{-\sqrt{7}}{3}$$

$$\cot \theta = \frac{3}{-\sqrt{7}} = -\frac{3}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = -\frac{3\sqrt{7}}{7}$$

$$\sec \theta = \frac{4}{3}$$

$$\csc \theta = -\frac{4}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = -\frac{4\sqrt{7}}{7}$$

use reciprocals



What is r ?

$$r^2 = x^2 + y^2$$

$$r^2 = (3)^2 + (-\sqrt{7})^2$$

$$r^2 = 9 + 7$$

$$r^2 = 16$$

$$r = \pm 4$$

$$r = +4 \text{ only}$$

19. $(0, 2)$

$$\sin \theta = \frac{y}{r} = \frac{2}{2} = 1$$

$$\cos \theta = \frac{x}{r} = \frac{0}{2} = 0$$

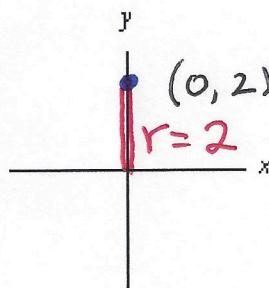
$$\tan \theta = \frac{y}{x} = \frac{2}{0} = \text{undefined}$$

$$\cot \theta = \frac{0}{2} = 0$$

$$\sec \theta = \frac{1}{0} = \text{undefined}$$

$$\csc \theta = \frac{2}{2} = 1$$

reciprocals:



What is r ? $r=2$.

when the point is an axial point, the radius is very easy to find; it's the distance along that axis.

#20 and #21 are similar to #18 in that we have a point in the x-y-plane. However, in #18 we were given the point (x, y) and

Find and simplify the requested trig values based on the information given. Rationalize the denominator, if necessary.

20. If θ terminates in Quadrant IV and $\cot\theta = -\frac{3}{4}$, find

$$(+, -) \\ x, y$$

$$\sin\theta = \frac{y}{r} = \boxed{-\frac{4}{5}}$$

$$\tan\theta = \frac{y}{x} = \boxed{-\frac{4}{3}}$$

$\sec\theta =$ Find $\cos\theta$ first

$$\cos\theta = \frac{x}{r} = \frac{3}{5}$$

$$\text{so, } \sec\theta = \boxed{\frac{5}{3}}$$

21. If θ terminates in Quadrant II and $\csc\theta = \frac{3}{\sqrt{5}}$, find

$$(-, +) \\ x, y$$

$$\sin\theta = \frac{y}{r} = \boxed{\frac{\sqrt{5}}{3}}$$

$$\cos\theta = \frac{x}{r} = \boxed{-\frac{2}{3}}$$

$$\tan\theta = \frac{y}{x} = \frac{\sqrt{5}}{-2} = \boxed{-\frac{\sqrt{5}}{2}}$$

$$\tan\theta = -\frac{4}{3} = \frac{-4}{3} = \frac{y}{x}$$

$$y = -4 \\ x = +3$$

(these values are consistent with θ in Q IV.)

Find r :

$$r^2 = x^2 + y^2$$

$$r^2 = (3)^2 + (-4)^2$$

$$r^2 = 9 + 16$$

$$r^2 = 25$$

$$r = \pm \sqrt{25}$$

$$r = +5$$

the value of r . In #20, we get x and y in a different way, then find r .

In #21, we get y and r first, and then must find x .

$$\sin\theta = \frac{\sqrt{5}}{3} = \frac{y}{r}$$

$$y = \sqrt{5} \\ r = 3$$

Find x :

$$x^2 + y^2 = r^2$$

$$x^2 + (\sqrt{5})^2 = (3)^2$$

$$x^2 + 5 = 9$$

$$x^2 = 4$$

$$x = \pm \sqrt{4}$$

$$x = -2$$

x is negative because θ terminates in Q II