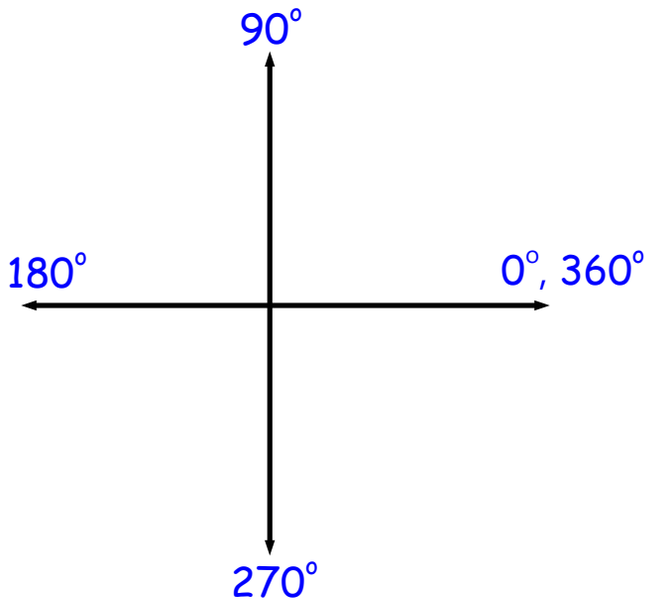
Exact Angles - Multiples

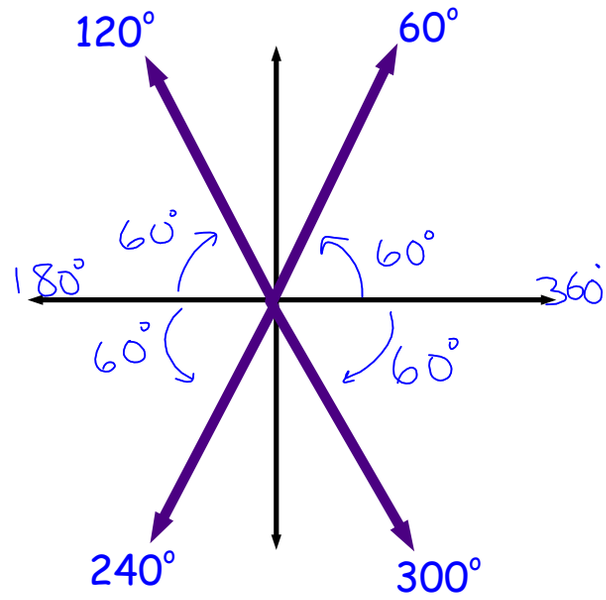
In Degrees

To look at 90°, 60°, 45°, 30°

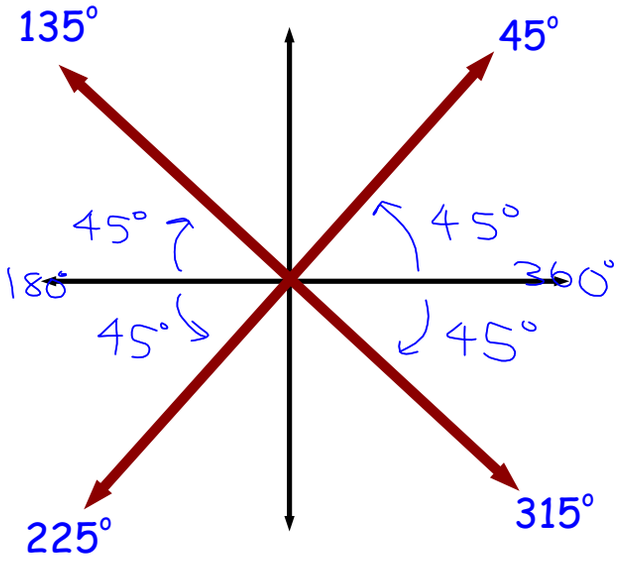
90° - Multiples



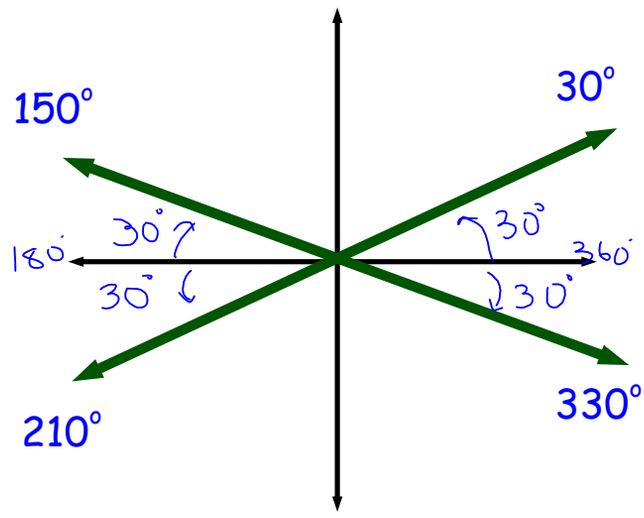
60° - Multiples



45° - Multiples

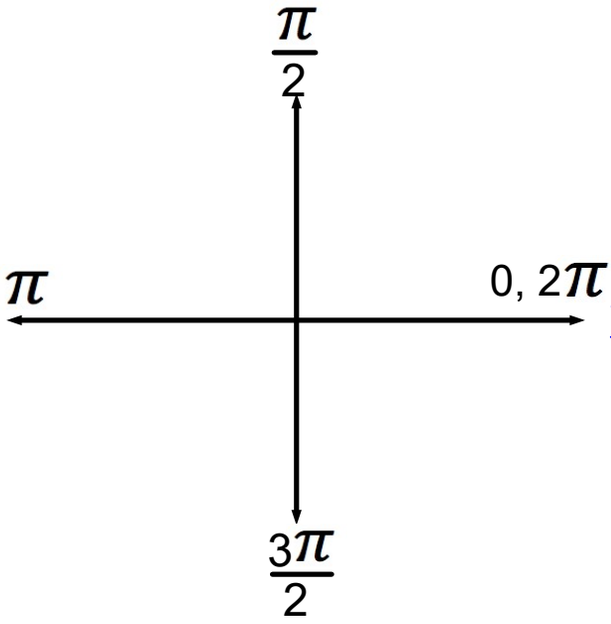


30° - Multiples

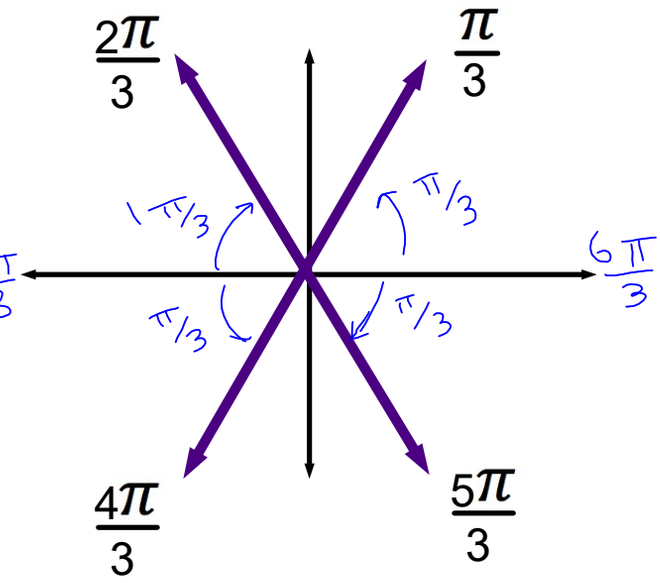


In Radians **exactly**

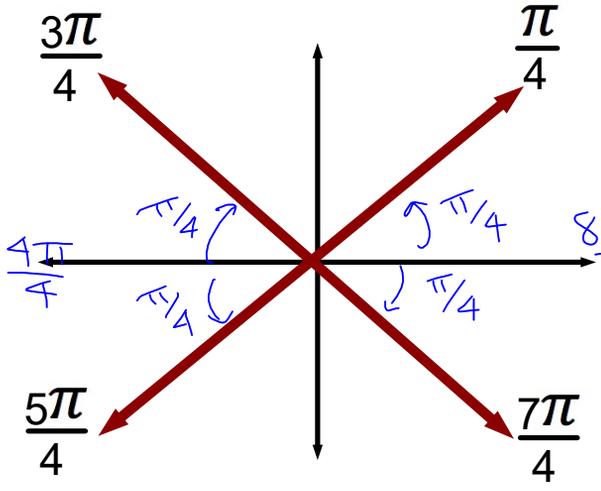
(90°) $\frac{\pi}{2}$ - multiples



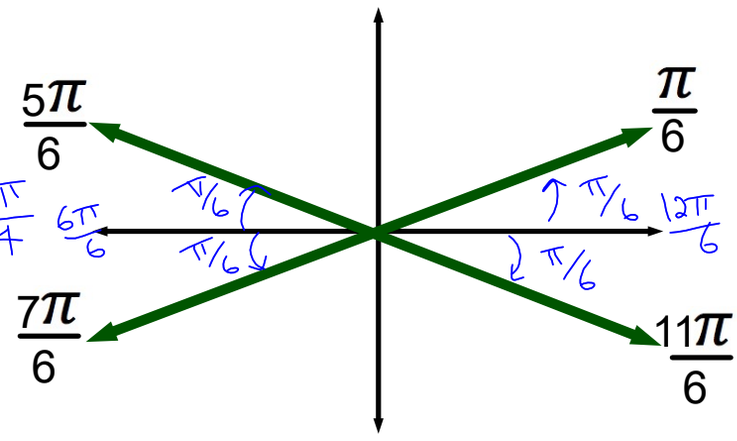
(60°) $\frac{\pi}{3}$ - multiples

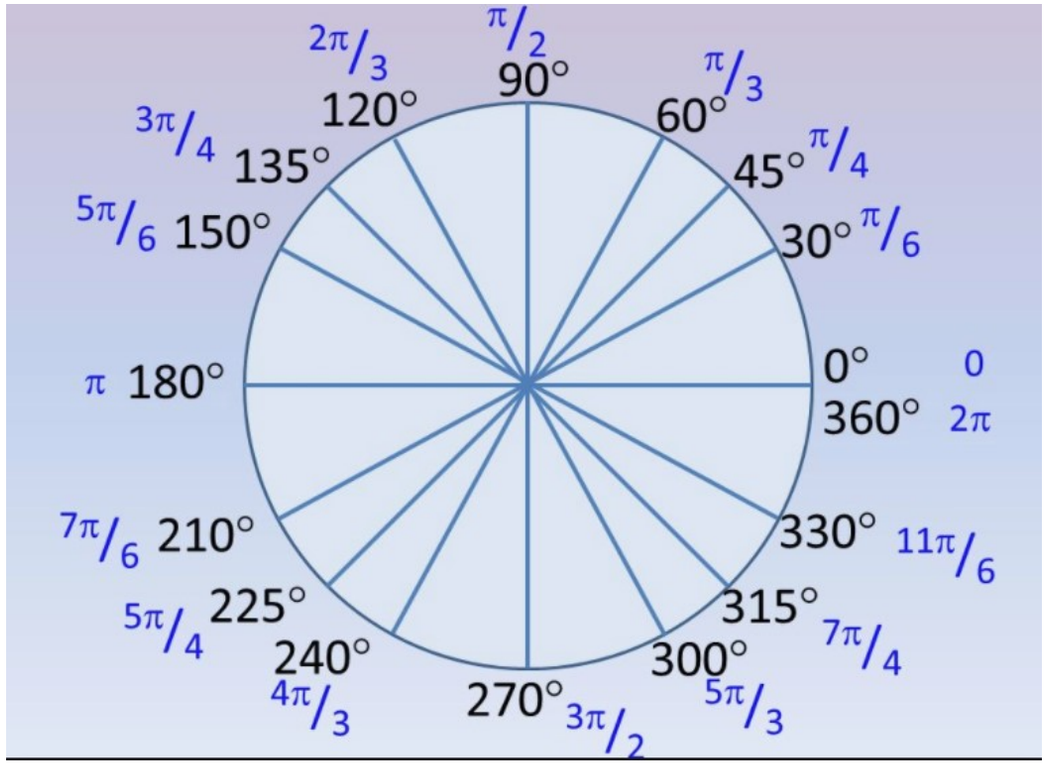


(45°) $\frac{\pi}{4}$ - multiples



(30°) $\frac{\pi}{6}$ - multiples



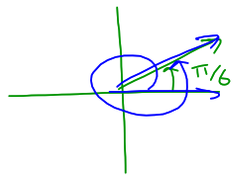

π/2
90°
2π/3
120°
π/3
60°
3π/4
135°
π/4
45°
5π/6
150°
π/6
30°
π
180°
0°
0
360°
2π
7π/6
210°
330°
11π/6
5π/4
225°
315°
7π/4
240°
300°
4π/3
270°
3π/2
5π/3

State answer **over [0,2π]** radians in **positive rotation**

ex 1) $\frac{13\pi}{6}$

$\frac{13\pi}{6} - \frac{12\pi}{6}$

$= \frac{\pi}{6}$



ex 2) $-\frac{13\pi}{3}$ $+\frac{6\pi}{3} = -\frac{7\pi}{3}$

$-\frac{13\pi}{3} + \frac{18\pi}{3}$

$= \frac{5\pi}{3}$

$-\frac{7\pi}{3} + \frac{6\pi}{3} = -\frac{\pi}{3}$

$-\pi/3 + \frac{6\pi}{3} = \frac{5\pi}{3}$

ex 3) $\frac{9\pi}{2}$ $-\frac{8\pi}{2}$

$= \frac{\pi}{2}$

ex 4) $-\frac{5\pi}{6}$ $+\frac{12\pi}{6}$

$\frac{7\pi}{6}$

ex 5) $\frac{19\pi}{4}$ $-\frac{8\pi}{4} - \frac{8\pi}{4}$

$\frac{19\pi}{4} - \frac{16\pi}{4} = \frac{3\pi}{4}$

ex 6) $480° - 360° = 120°$

ex 7) $19\pi - 18\pi$

$= \pi$

ex 8) $\frac{101\pi}{4}$ $-\frac{80\pi}{4}$

$\frac{21\pi}{4} - \frac{16\pi}{4}$

$= \frac{5\pi}{4}$

Locating Angles WS key

1. $\pi/6$
2. $7\pi/6$
3. $7\pi/4$
4. $5\pi/4$
5. $5\pi/6$
6. $5\pi/6$
7. $5\pi/4$
8. $7\pi/4$
9. $3\pi/4$
10. $\pi/4$
11. $\pi/6$
12. $\pi/4$
13. $\pi/4$
14. $\pi/4$
15. $4\pi/3$
16. $\pi/6$
17. $\pi/2$
18. π
19. 0
20. $2\pi/3$
21. $5\pi/3$
22. $7\pi/6$
23. $5\pi/4$
24. $3\pi/2$
25. 150°
26. 330°
27. 120°
28. 0°
29. 150°
30. 180°