Homework 9.3

Draw an angle with the given measure in standard position.
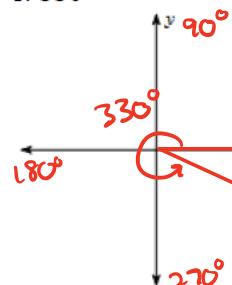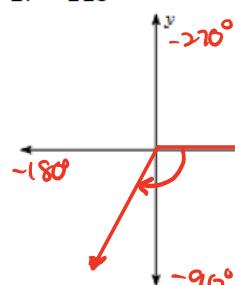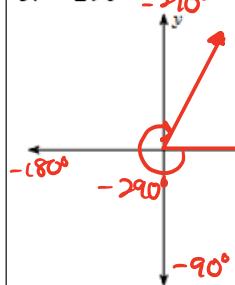
| 1. 330°	2. −115°	3. −290°	4. 440°
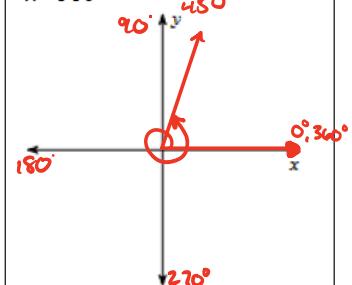
Find the measure of each angle.

5.	6.	7.	8.

6. $750°$

7. $180 - 105° = 75°$
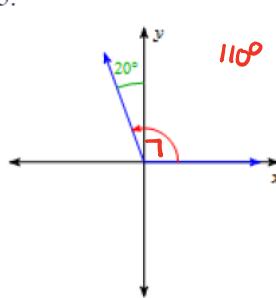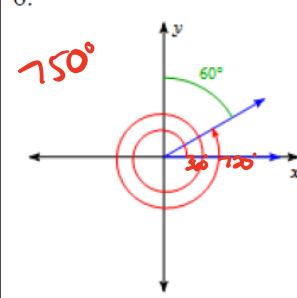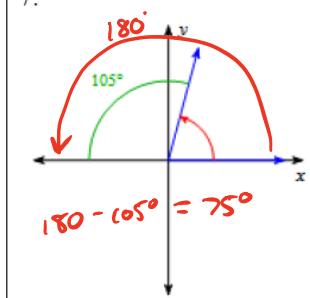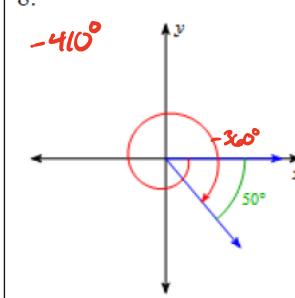
State the quadrant in which the terminal side of each angle lies.

9. −446°	10. 870°	11. −190°	12. 215°

9. $-446° + 360° = -86°$ — IV

10. $870 - 720° = 150$ — II

11. II

12. III
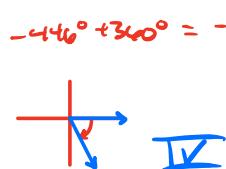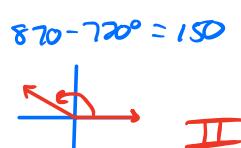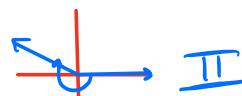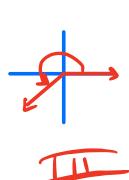
Find one positive and one negative coterminal angle the angle given.

13. 30°

+ Coterminal $\angle$: $30° + 360° = 390°$

− Coterminal $\angle$: $30° - 360° = -330°$

14. −705°

+ Coterminal $\angle$: $-705° + 720 = 15°$

− Coterminal $\angle$: $-705° + 360 = -345°$

Find a coterminal angle between 0° and 360°.

15. −45°

Coterminal $\angle$: $-45° + 360° = 315°$

16. 435°

Coterminal $\angle$: $435° - 360° = 75°$

$\in$ = is an element of
Z = set of all integers

Find ALL coterminal angles.

17.

Coterminal $\angle$: $175° + 360°k$
where $k \in Z$
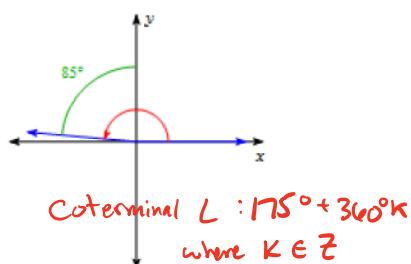
18. $-200°$

Coterminal $\angle$: $-200° + 360°k$
where $k \in Z$

19. $90°$

Coterminal $\angle$: $90° + 360°k$
where $k \in Z$

Convert to decimal degree.

20. $43°20'$

$$\left(43 + \frac{20}{60}\right)^\circ = 43.333°$$

21. $125°25'30''$

$$\left(125 + \frac{25}{60} + \frac{30}{3600}\right)^\circ = 125.425°$$

22. $61°52'17''$

$$\left(61 + \frac{52}{60} + \frac{17}{3600}\right)^\circ = 61.871°$$

23. $-28°5'42''$

$$-\left(28 + \frac{5}{60} + \frac{42}{3600}\right)^\circ = -28.095°$$

Convert to degrees, minutes, and seconds.

24. $42.35°$

$.35(60) = 21'$

$42° 21'$

25. $142.125°$

$.125(60) = 7.5'$
$.5(60) = 30''$

$142° 7' 30''$

26. $-60.4°$

$.4(60) = 24'$

$-60° 24'$

27. $218.68°$

$.68(60) = 40.8'$
$.8'(60) = 48''$

$218° 40' 48''$

Determine if the statement is true or false. If it is false, give a counterexample.

28. If the terminal side of an angle in standard position lies in quadrant I, then the angle is positive.

False
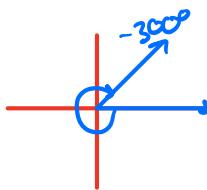
29. If the initial and terminal sides of an angle coincide, then the measure of the angle is zero.

True.

9.3 Part 2

Draw an angle with the given measure in standard position.

1. $\frac{\pi}{6}$

2. $-\frac{5\pi}{3}$

3. $\frac{3\pi}{4}$

4. $-\frac{12\pi}{5}$
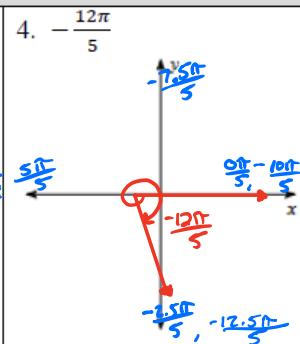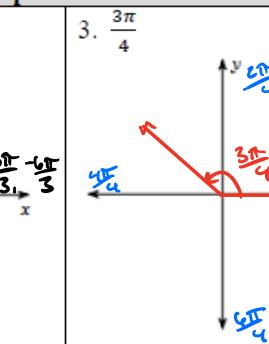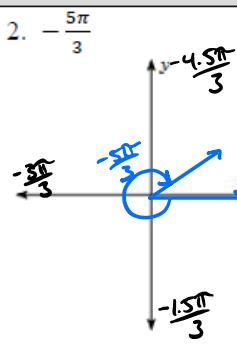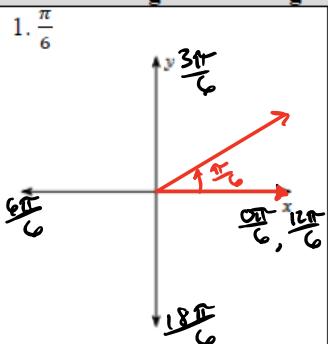
Find the measure of each angle. (IN RADIANS!)
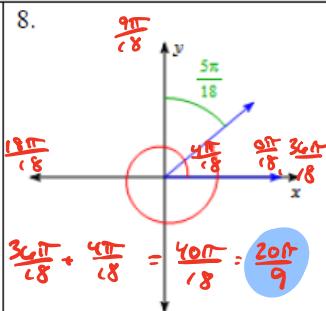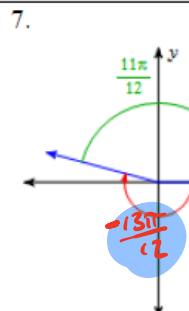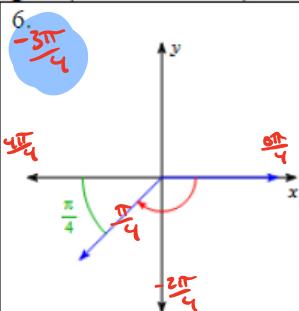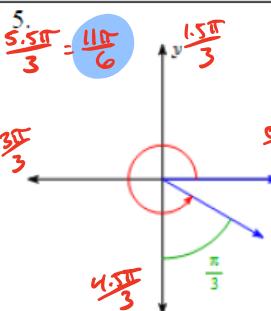
5. $5.5\frac{\pi}{3} = \frac{11\pi}{6}$

6. $-\frac{3\pi}{4}$

7. $-\frac{13\pi}{12}$

8. $\frac{36\pi}{18} + \frac{4\pi}{18} = \frac{40\pi}{18} = \frac{20\pi}{9}$

State the quadrant in which the terminal side of each angle lies.

9. $\frac{15\pi}{4}$ IV

10. $\frac{5\pi}{6}$ II

11. $-\frac{10\pi}{9}$ II

12. $-\frac{17\pi}{6}$ III
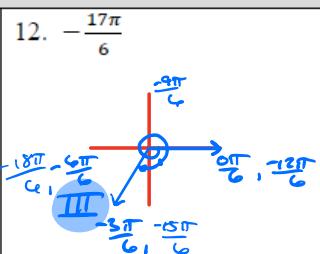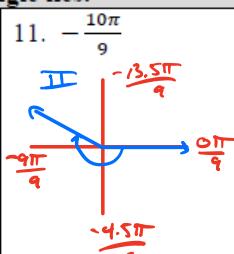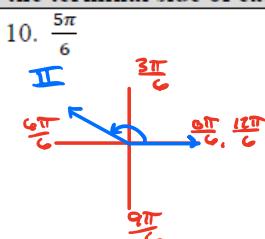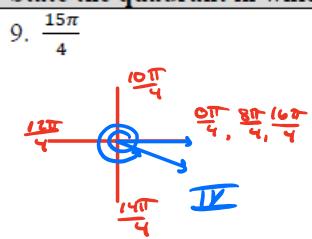
Find one positive and one negative coterminal angle the angle given. (IN RADIANS!)

13. $\frac{\pi}{3}$

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

$-$ coterminal $= \frac{\pi}{3} - \frac{6\pi}{3} = \frac{-5\pi}{3}$

14. $\frac{5\pi}{4}$

$+$ coterminal $= \frac{5\pi}{4} + \frac{8\pi}{4} = \frac{13\pi}{4}$

$-$ coterminal $= \frac{5\pi}{4} - \frac{8\pi}{4} = \frac{-3\pi}{4}$

**Find a coterminal angle between 0 and 2π.**

15. $\frac{9\pi}{4}$

(1 Rev)

$coterminal = \frac{9\pi}{4} - \frac{8\pi}{4} = \frac{\pi}{4}$

16. $\frac{13\pi}{2}$

(3 Rev)

$coterminal = \frac{13\pi}{2} - \frac{12\pi}{2} = \frac{\pi}{2}$

Find ALL coterminal angles in the world for each angle.

17.
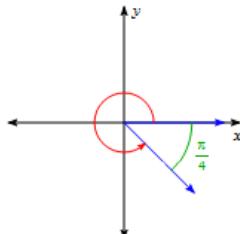
$-\frac{\pi}{4} + 2\pi k$ where $k \in \mathbb{Z}$

18. $\frac{\pi}{2}$

$\frac{\pi}{2} + 2\pi k$ where $k \in \mathbb{Z}$

Convert each degree measure into radians.

19. $225°$

$\frac{225°}{1} \cdot \frac{\pi}{180°} = \frac{5\pi}{4}$

20. $280°$

$\frac{280°}{1} \cdot \frac{\pi}{180°} = \frac{14\pi}{9}$

21. $-210°$

$\frac{-210°}{1} \cdot \frac{\pi}{180°} = \frac{-7\pi}{6}$

22. $-1020°$

$\frac{-1020°}{1} \cdot \frac{\pi}{180°} = \frac{-102\pi}{18} = \frac{-51\pi}{9} = \frac{-17\pi}{3}$

Convert each radian measure into degrees.

23. $-\frac{5\pi}{9}$

$\frac{-5\pi}{9} \cdot \frac{180°}{\pi} = -100°$

24. $\frac{5\pi}{6}$

$\frac{5\pi}{6} \cdot \frac{180°}{\pi} = 150°$

25. $\frac{23\pi}{36}$

$\frac{23\pi}{36} \cdot \frac{180°}{\pi} = 115°$

26. $\frac{79\pi}{18}$

$\frac{79\pi}{18} \cdot \frac{180°}{\pi} = 790°$