

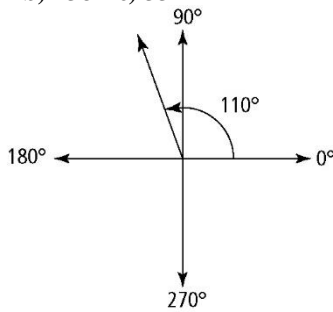
Chapter 4 BLM Answers

BLM 4-1 Chapter 5 Prerequisite Skills

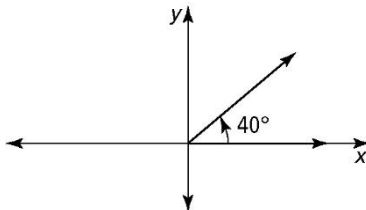
1. Estimates will vary. Actual measurements are as follows:

a) 52° b) 138° c) 334°

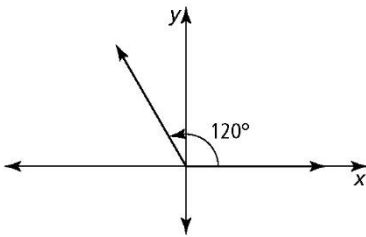
2. a)



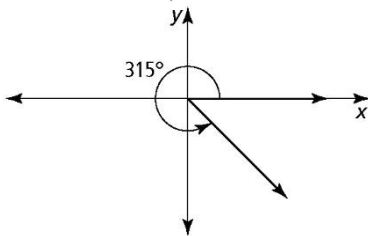
b)



c)



d)



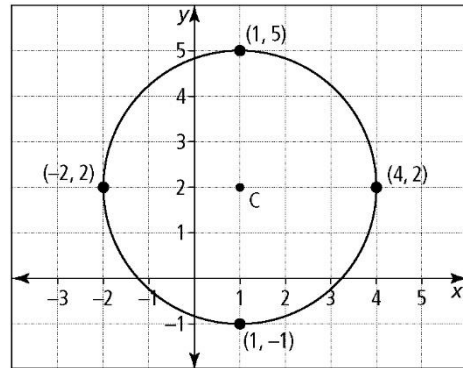
3. a) IV b) II c) I d) III e) IV f) II

4. a) 40° b) 40° c) 80° d) 85° e) 50.6° f) 6°

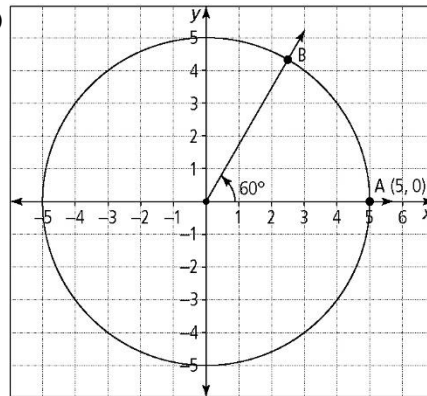
5. a) $12\,756\pi$; 40 074.2 km b) $\frac{47.1}{2\pi}$; 7.5 mm

c) $C = 23.25\pi$; 73.0 in.

6.



7. a)



b) $(10\pi)\left(\frac{1}{6}\right) = \left(\frac{5\pi}{3}\right)$ c) 5.2 units

8. a) $AB = \sqrt{41}$ b) $CE = 6\sqrt{3}$ c) $FG = 2$

9. a) 322° b) 252.5° c) 169° d) 132.9°

10. $\cos A = \frac{1}{\sqrt{5}}$; $\tan C = \frac{1}{2}$ b) $\sin Y = \frac{y}{3}$; $\tan X = \frac{x}{y}$

11. a) 0.59 b) 0.05 c) -0.58

d) -0.99 e) 19.08 f) -0.97

12. a) $6y(x-2y)(x+2y)$ b) $(x-10)(x-1)$

c) $3(2x-1)(x-3)$ d) $(3x+2)(2x-5)$

13. a) $x = \pm 3$ b) $x = \frac{3}{2}$ or 1.5

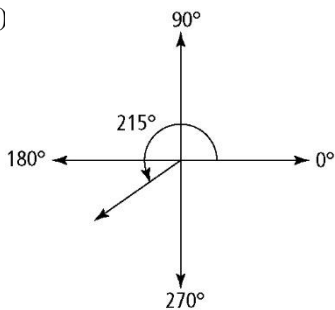
c) $y = -10$ or 3 d) $y = 4 \pm \sqrt{3}$

14. 31.95 cm



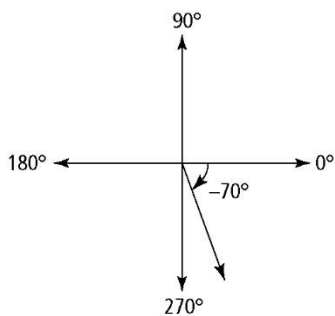
BLM 4-2 Section 4.1 Extra Practice

1. a)



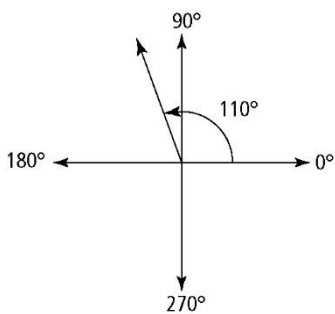
quadrant III

b)



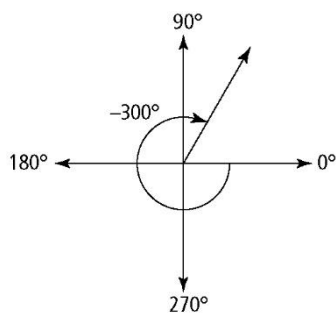
quadrant IV

c)



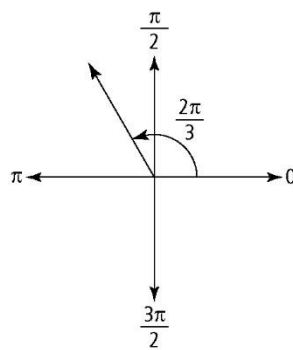
quadrant II

d)



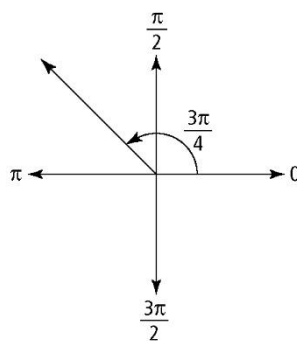
quadrant I

2. a)



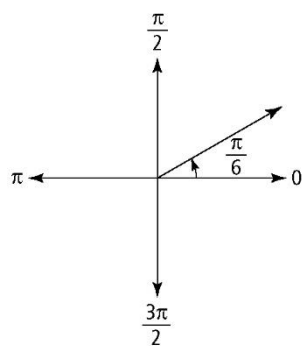
quadrant II

b)



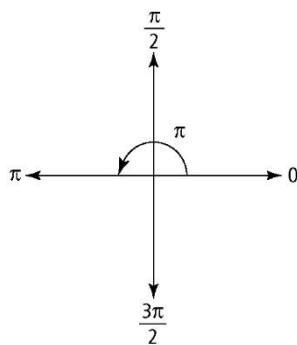
quadrant II

c)



quadrant I

d)



no quadrant



3. a) $\frac{5\pi}{6}$, 2.62 b) $\frac{4\pi}{3}$, 4.19
 c) $\frac{\pi}{4}$, 0.79 d) $\frac{31\pi}{18}$, 5.41
 4. a) 144° b) 150° c) 123.75° d) -315°
 5. a) 183° b) 229° c) 344° d) -143°
 6. a) 810° , 1170° b) $\frac{11\pi}{5}$, $\frac{21\pi}{5}$ c) 7.98, 14.27

7. a) subtract 360°
 b) subtract 2π , and use fractions to determine the exact value
 c) subtract 2π using your calculator, and then round your answer to the required accuracy

8. a) $75^\circ \pm (360^\circ)n$, where n is a natural number
 b) $\left(\frac{\pi}{3} \pm 2\pi n\right)$ radians, where n is a natural number

- c) $(1 \pm 2\pi n)$ radians, where n is a natural number

9. 20.9 cm

10. 1.43 radians

BLM 4-3 Section 4.2 Extra Practice

1. a) $x^2 + y^2 = 16$ b) $x^2 + y^2 = 5$
 c) $x^2 + y^2 = 82.81$ d) $x^2 + y^2 = 121$

2. $\left(-\frac{5}{13}, \frac{12}{13}\right)$ and $\left(-\frac{2}{3}, -\frac{\sqrt{5}}{3}\right)$; When the coordinates are substituted into $x^2 + y^2 = 1$, the LHS equals the RHS.

3. a) $\left(-\frac{2}{3}, -\frac{\sqrt{5}}{3}\right)$ b) $\left(-\frac{3}{5}, \frac{4}{5}\right)$

- c) $\left(\frac{5}{6}, -\frac{\sqrt{11}}{6}\right)$ d) $\left(\frac{4\sqrt{3}}{7}, \frac{1}{7}\right)$

4. a) $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ b) $(0, -1)$

- c) $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ d) $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

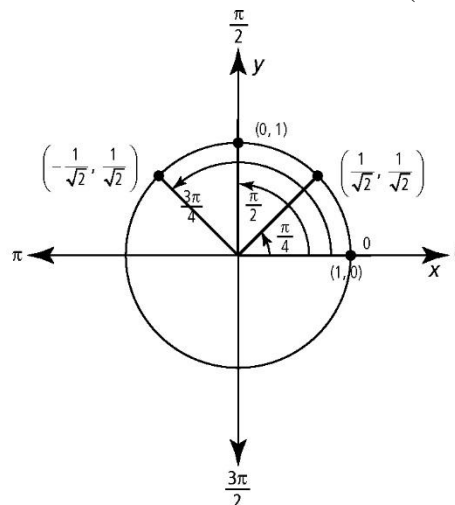
5. a) $\left(-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ b) $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

- c) $(1, 0)$ d) $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

6. a) 225° b) 180° c) 315° d) 240°

7. a) 0π b) $\frac{5\pi}{3}$ c) $\frac{5\pi}{6}$ d) π

8.



9. a) $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ b) $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

10. a) $\left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$ b) $\left(-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

BLM 4-5 Section 4.3 Extra Practice

1. a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) -1 d) -1 e) $\frac{2}{\sqrt{3}}$ or $\frac{2\sqrt{3}}{3}$ f) -1

2. a) $\frac{1}{\sqrt{3}}$ or $\frac{\sqrt{3}}{3}$ b) $-\frac{1}{2}$ c) -1 d) -1

- e) $\sqrt{3}$ f) $\sqrt{2}$

3. a) 0.64 b) -0.82 c) -2.36 d) -1.19

4. a) -1.25 b) -0.73 c) 1.03 d) 0.68

5. a) II or III b) I or II c) I or III

- d) IV e) IV f) II

6. a) $-\sin 50^\circ$ b) $\cos 50^\circ$ c) $-\tan 80^\circ$

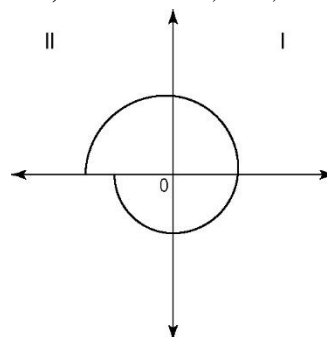
- d) $-\csc 80^\circ$ e) $\cot 20^\circ$ f) $\sec 70^\circ$

7. a) 135° , 315° b) -30° , 30°

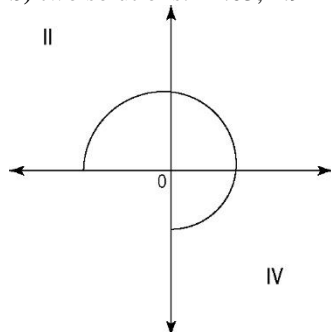
- c) 30° d) -270° , -90° , 90° , -270°

8. a) $\frac{\pi}{3}$, $\frac{2\pi}{3}$ b) $-\pi$, π c) $\frac{2\pi}{3}$, $\frac{4\pi}{3}$ d) $-\frac{\pi}{4}$, $\frac{3\pi}{4}$, $\frac{7\pi}{4}$

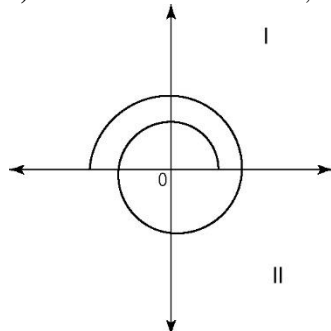
9. a) two solutions; 0.43, 2.71



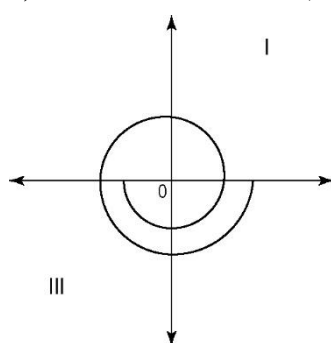
b) two solutions: $-2.03, 2.94$



c) three solutions: $-281.85^\circ, -78.15^\circ, 78.15^\circ$



d) three solutions: $-123.69^\circ, 56.31^\circ, 236.31^\circ$



$$10. \sin \theta = -\frac{12}{13} \quad \csc \theta = -\frac{13}{12}$$

$$\cos \theta = \frac{5}{13} \quad \sec \theta = \frac{13}{5}$$

$$\tan \theta = -\frac{12}{5} \quad \cot \theta = -\frac{5}{12}$$

BLM 4-6 Section 4.4 Extra Practice

1. a) $60^\circ, 300^\circ$ b) $120^\circ, 300^\circ$
 c) $30^\circ, 150^\circ$ d) $120^\circ, 240^\circ$
2. a) $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$ b) $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$
 c) $\frac{\pi}{2}, \frac{\pi}{4}, \frac{5\pi}{4}$ d) $\frac{\pi}{3}, \frac{5\pi}{3}$
3. a) $\frac{\pi}{2}$ b) $0, \frac{\pi}{3}, \frac{5\pi}{3}$ c) $-\frac{\pi}{2}, \frac{\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$

4. a) 1.35, 4.49 b) 1.76, 4.90

c) 1.14, 2.00 d) 0.08, 3.22

5.	LS	RS	LS	RS
	$\sin^2 \theta - 1$	0	$\sin^2 \theta - 1$	0
	$= \left(\sin \frac{\pi}{2}\right)^2 - 1$		$= \left(\sin \frac{3\pi}{2}\right)^2 - 1$	
	$= (1)^2 - 1$		$= (-1)^2 - 1$	
	$= 0$		$= 0$	

6. No. Example: The range of the cosine function is $[-1, 1]$. Cosine is undefined for values that are outside of this range.

7. a) 0.7854, 2.1910, 3.9270, 5.3326

b) 1.1071, 1.240, 4.2487, 4.3906

c) 0, 1.3258, 4.4674

8. $2\pi n, n \in \mathbb{I}$

9. $x = \pi n, -\frac{\pi}{2} + 2\pi n$

10. $(1 + 4n)\frac{\pi}{6}, n \in \mathbb{I}$

BLM 4-8 Chapter 4 Test

1. C

2. A

3. A

4. C

5. D

6. a) Example: unitary method; $\frac{3\pi}{2}; \approx 4.71$

b) Example: proportion method; $-3\pi; \approx -9.42$

c) Example: unit analysis; $\frac{5\pi}{6}; \approx 2.62$

d) Example: unitary method; $\frac{4\pi}{3}; \approx 4.19$

7. a) Example: proportion method; $\approx 186.21^\circ$

b) Example: unitary method; $\approx 22.92^\circ$

c) Example: unit analysis; -315°

d) Example proportion method; $\approx -306.53^\circ$

8. $\frac{9\pi}{2}$

9. a) $\theta \approx 133.69^\circ$ or 2.33 b) $a \approx 31.85$ cm

c) $r \approx 6.99$ m d) $a \approx 4.28$ ft

10. $\frac{-3}{4}$

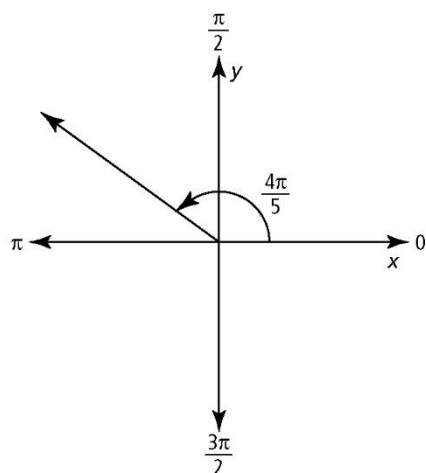
11. 0.6

12. $\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right), \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

13. $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$



14. a)



b) $\frac{4\pi}{5} + 2\pi n, n \in \mathbb{I}$

15. $\sin \theta = \frac{-4}{5}, \cos \theta = \frac{3}{5}, \tan \theta = \frac{-4}{3},$

$\csc \theta = \frac{-5}{4}, \sec \theta = \frac{5}{3}, \cot \theta = \frac{-3}{4}$

16. $-\frac{\pi}{4}, \frac{\pi}{4}$

17. a) Equation A: $\theta = \frac{\pi}{3}, \frac{2\pi}{3}$; Equation B: $\theta = \frac{\pi}{4}$

b) Equation C is the product of Equation A times Equation B (i.e., $AB = C$). Therefore, the solution to

Equation C is the solutions to A and B: $\theta = \frac{\pi}{4}, \frac{\pi}{3}, \frac{2\pi}{3}$.

