MATH 127 - Exam 3 Review
All material covered in class is eligible for exam, this review is not all inclusive.

In problems 1-3, a right triangle has legs \(a\) and \(b\) and hypotenuse \(c\). Angles \(A\), \(B\), and \(C\) are opposite sides \(a\), \(b\), and \(c\), respectively.

1. If \(a = 7\), \(B = 50^\circ\) find \(b\), \(c\), and \(A\).
2. If \(c = 10\), \(A = 40^\circ\) find \(a\), \(b\), and \(B\).
3. If \(b = 4\), \(c = 6\) find \(a\), \(A\), and \(B\).

4. The hypotenuse of a right triangle is 3 feet. If one leg is 1 foot, find the degree measure of each angle.

5. A 22-foot extension ladder leaning against a building makes a \(70^\circ\) angle with the ground. How far up the building does the ladder touch?

6. A ship leaves the port of Miami with a bearing of S80°E and a speed of 15 knots. After 1 hour, the ship turns 90° toward the south. After 2 hours, maintaining the same speed, what is the bearing to the ship from port?

7. Solve the triangle. \(A = 50^\circ\), \(C = 20^\circ\), \(a = 3\)

In problems 8-10, two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that result.

8. \(b = 4\), \(c = 3\), \(B = 40^\circ\)
9. \(b = 2\), \(c = 3\), \(B = 40^\circ\)
10. \(b = 4\), \(c = 5\), \(B = 95^\circ\)

11. A loading ramp 10 feet long that makes an angle of 18° with the horizontal is to be replaced by one that makes an angle of 12° with the horizontal. How long is the new ramp?
12. Solve the triangle.  \( a = 2, c = 1, B = 10^\circ \)

13. Solve the triangle.  \( a = 3, b = 3, c = 2 \)

14. An airplane flies due north from Ft. Myers to Sarasota, a distance of 150 miles, and then turns N50\(^\circ\)E and flies to Orlando, a distance of 100 miles. How far is it directly from Ft. Myers to Orlando?

15. If \( a = 6, b = 4, C = 60^\circ \), find the area of the triangle, to two decimal places.

16. If \( a = 4, b = 3, c = 6 \), find the area of the triangle, to two decimal places.

17. The dimensions of a triangular lot are 100 feet by 50 feet by 75 feet. If the price of such land is $3 per square foot, how much does the land cost?

18. Be able to plot polar coordinates such as \( (4, 270^\circ), (−3, 120^\circ), (2, −\frac{5\pi}{4}) \), etc.

19. Find other polar coordinates of \( (4, \frac{3\pi}{4}) \) to meet the following conditions:

   (a) \( r > 0, \ -2\pi \leq \theta < 0 \)

   (b) \( r < 0, \ 0 \leq \theta < 2\pi \)

   (c) \( r > 0, \ 2\pi \leq \theta < 4\pi \)

20. Find other polar coordinates of \( (−2, −\frac{2\pi}{3}) \) to meet the following conditions:

   (a) \( r > 0, \ -2\pi \leq \theta < 0 \)

   (b) \( r < 0, \ 0 \leq \theta < 2\pi \)

   (c) \( r > 0, \ 2\pi \leq \theta < 4\pi \)

21. Find the rectangular coordinates of the polar coordinate \( (5, 300^\circ) \)

22. Find the rectangular coordinates of the polar coordinate \( (−2, \frac{2\pi}{3}) \)

23. Find the polar coordinates of the rectangular coordinate \( (0, −2) \)

24. Find the polar coordinates of the rectangular coordinate \( (−3, 3) \)