

Accelerated Math 3

Topics and Suggested Review Problems – Test 5

Test 5 will have the following 2 topics from the previous tests: (1) solving trig equations and (2) displacement vectors. The new topics will come from three general areas: (1) conic sections, (2) polar coordinates and equations, and (3) complex numbers in trig form.

Trig equations (see example 3 on p. 172)

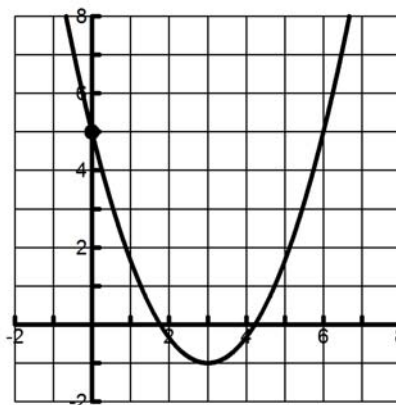
1. Solve $2\sin^2(x) - 3\sin(x) = 0$ for $0 \leq x \leq 2\pi$
2. Solve $\tan^2 \theta - 2\tan \theta = 15$ for $-90^\circ \leq \theta \leq 90^\circ$

Displacement vectors (see example 4 on p. 457)

3. Given points $D(-3,7)$ and $E(12,-8)$, find the displacement vector \overrightarrow{ED} .
4. (a) Find the coordinates of point H if it is $2/3$ of the way from D to E .
(b) Find the coordinates of point F if it is $2/3$ of the way from E to D .

Conic sections (see examples 1, 2, 3, 5, 6 on p. 549–553)

5. Sketch the graph of $\left(\frac{x-4}{3}\right)^2 + \left(\frac{y+3}{2}\right)^2 = 1$.
What is the center? What are the x -radius and y -radius?
6. Write the equation of the graph in #5 in parametric form.
7. Write the parametric equation of a hyperbola that is centered at the origin, opens up and down and has an x -radius of 4 and a y -radius of 1.
8. Write the equation in #5 in general form, that is, as $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$.
9. Write the equation for the parabola shown to the right.



Polar coordinates and equations

10. Write the rectangular coordinates $(1,7)$ in polar form.
11. Write the polar coordinates $(-3,105^\circ)$ in rectangular form.
12. Write the equation $r = 5\csc \theta$ in rectangular coordinates.
13. Write the equation $(x+4)^2 + (y+2)^2 = 20$ in polar coordinates.
14. Write the equation of a circle with a radius of 5 centered at the origin in polar coordinates.
15. Analyze the following equation: $r = 2 + 7\sin \theta$
16. Analyze the following equation: $r = 3\cos 6\theta$
Analyze means that you should find the domain, range, symmetry, maximum r values (if appropriate), name of the curve (limaçon), number of petals (roses), etc.

Complex numbers in trig form (you must show work)

17. Write the complex number $z = 1 + 7i$ in trig form.
18. Write the complex number $z = -3[\cos(105^\circ) + i\sin(105^\circ)]$ in rectangular form.
18. If $z = 3[\cos(35^\circ) + i\sin(35^\circ)]$ and $w = -2 + 3i$, find zw and z/w
19. Find w^5 . You may write your answer in decimal form.
20. Find the cube roots of $0 - 3i$
21. Find the eight roots of 1 (unity).