1. The distance between \((-2,3)\) and \((1,4)\) is
   a) \(\sqrt{58}\)
   b) \(\sqrt{50}\)
   c) \(\sqrt{40}\)
   d) None of these

2. The equation \(2x^4 - 3x^2 - 5 = 0\) can have at most how many roots (real or complex)?
   a) 2
   b) 3
   c) 4
   d) 5
   e) 6

3. The line \(3x - 4y - 1 = 0\) is parallel to
   a) \(8x = 6y - 6\)
   b) \(8x + 6y + 5 = 0\)
   c) \(y = \frac{4}{3}x\)
   d) \(4y = 3x - 7\)
   e) \(4x - 3y - 1 = 0\)

4. Given the complex numbers \(u = 2 - 3i, v = 2 + i\), then \(u \cdot v = \)
   a) \(1 - 4i\)
   b) \(4 - 6i\)
   c) \(7 + 4i\)
   d) \(7 - 4i\)
   e) \(1 + 4i\)

5. Which of the shaded regions contain some points on the graph of \(y = \frac{1}{x}\)?
   a) \(R\) only
   b) \(S\) only
   c) \(T\) only
   d) \(R\) and \(S\)
   e) \(R\) and \(T\)
6. \( \sin^2 \theta = \)
   a) \( 2 \sin \theta \)
   b) \( \csc^2 \theta \)
   c) \( \cos^2 \theta - 1 \)
   d) \( 1 + \cos^2 \theta \)
   e) \( 1 - \cos^2 \theta \)

7. The solution of \(|6 + 2x| < 8\) is
   a) \( x < 1 \)
   b) \( -1 < x < 1 \)
   c) \( 7 < x < -1 \)
   d) \( -7 < x < 1 \)
   e) \( -7 < x < 7 \)

8. If \( g(x) = \frac{1}{3x - 1} \), then \( g(t + 1) = \)
   a) \( \frac{1}{t + 1} \)
   b) \( \frac{1}{3t - 2} \)
   c) \( \frac{t + 1}{3x - 1} \)
   d) \( \frac{1}{3t} \)
   e) None of these

9. The amplitude of the function \( g(x) = 4 \sin(3x + \frac{\pi}{2}) \) is
   a) \( \frac{\pi}{2} \)
   b) \( \frac{\pi}{2} \)
   c) \( \frac{2\pi}{3} \)
   d) 3
   e) 4

10. If \( 3 \log x = \log 8 \), then \( x = \)
    a) \( \frac{8}{3} \)
    b) 2
    c) 8
    d) \( \frac{\log 8}{3} \)
    e) \( \log \frac{8}{3} \)

11. An equation of a parabola with axis parallel to the y-axis and vertex at the point \((-1, 3)\) is
    a) \( y - 3 = (x + 1)^2 \)
    b) \( y + 3 = (x - 1)^2 \)
    c) \( x - 3 = (y + 1)^2 \)
    d) \( x + 3 = (y - 1)^2 \)
    e) None of these
12. An equation of the circle with center \((-3,4)\) and radius 5 is

a) \(9x^2 + 16y^2 = 25\)
b) \((x - 3)^2 + (y + 4)^2 = 5\)
c) \((x - 3)^2 + (y + 4)^2 = 25\)
d) \((x + 3)^2 + (y - 4)^2 = 5\)
e) \((x + 3)^2 + (y - 4)^2 = 25\)

13. One factor of \(x^3 - 27y^3\) is

a) \(x + 3y\)
b) \(x - 3y\)
c) \(x + 9y\)
d) \(x - 9y\)
e) None of these

14. A sketch of the graph of \(y = \cos x\) is

<table>
<thead>
<tr>
<th>a)</th>
<th>b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph a)</td>
<td>![Graph b)</td>
</tr>
</tbody>
</table>

15. If \(\sin A = \frac{1}{3}\) and \(0^\circ < A < 90^\circ\), then \(\cos A =\)

<table>
<thead>
<tr>
<th>a) (\frac{\sqrt{8}}{3})</th>
<th>b) (\frac{\sqrt{8}}{3})</th>
</tr>
</thead>
<tbody>
<tr>
<td>c) (\frac{3}{\sqrt{8}})</td>
<td>d) (\frac{\sqrt{8}}{9})</td>
</tr>
<tr>
<td>e) (\frac{\sqrt{8}}{10})</td>
<td></td>
</tr>
</tbody>
</table>
16. \((\cos \theta)(\tan \theta) =\)
   a) \(\sin \theta\)
   b) \(\frac{\cos^2 \theta}{\sin \theta}\)
   c) 1
   d) \(\cot \theta\)
   e) \(\sec \theta\)

17. If \(0^\circ \leq \theta \leq 180^\circ\) and \(\cos \theta = \frac{1}{2}\), then \(\theta = \)
   a) \(60^\circ\)
   b) \(45^\circ\)
   c) \(30^\circ\)
   d) \(\frac{1}{2}\)
   e) \(0^\circ\)

18. In the right triangle shown, if \(b = 2\), then \(c =\)
   a) \(2 \cos \alpha\)
   b) \(2 \sin \alpha\)
   c) \(\frac{2}{\cos \alpha}\)
   d) \(\frac{2}{\sin \alpha}\)
   e) \(\frac{\sin \alpha}{2}\)

19. A straight rod has one end attached to the \(x\)-axis at \((4,0)\) and the other end on the \(y\)-axis. If the rod forms an angle at \(60^\circ\) with the \(x\)-axis, how long is the rod?
   a) 6
   b) 8
   c) \(2\sqrt{3}\)
   d) \(4\sqrt{3}\)
   e) \(\frac{8\sqrt{3}}{3}\)

END OF TEST.