MAC 1114 Review for Exam 5 Part 1

Name_____

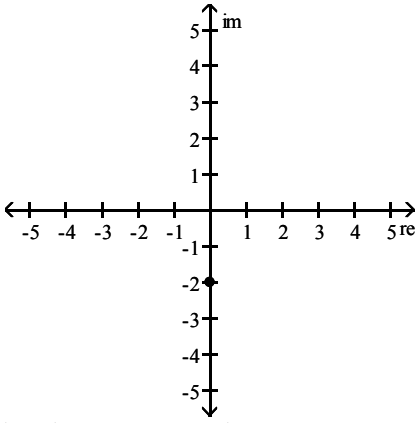
Find the absolute value of the complex number.

1) −3 + 4i 1) _____

A) $\sqrt{7}$ B) 7 C) 5 D) 25

Express the indicated number in standard notation or trigonometric notation, as directed.

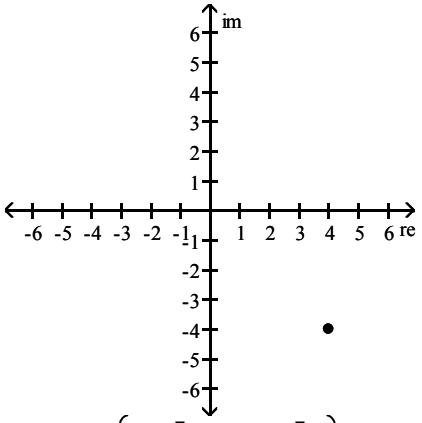
2) Express the indicated number in trigonometric notation. 2) _____



A) −2(cos 0° + i sin 0°) B) 2(cos 270° + i sin 270°)

C) 2(cos 270° − i sin 270°) D) 2(cos 90° + i sin 90°)

3) Express the indicated number in trigonometric notation. 3) _____



A) $4\sqrt{2}\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$ B) $4\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$

C) $4\sqrt{2}\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$ D) $4\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$

Express the complex number in trigonometric form.

4) 2 − 2i Express your answer in radians. 4) _____

A) $2\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$ B) $2\sqrt{2}\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$

C) $2\sqrt{2}\left(\cos\frac{7\pi}{4} + i\sin\frac{7\pi}{4}\right)$ D) $2\left(\cos\frac{5\pi}{4} + i\sin\frac{5\pi}{4}\right)$

5) $-5+5\sqrt{3}i$ Express your answer in radians. 5) _____

A) $5\sqrt{3}\left(\cos\frac{2\pi}{3}+i\sin\frac{2\pi}{3}\right)$ B) $10\left(\cos\frac{5\pi}{6}+i\sin\frac{5\pi}{6}\right)$

C) $10\left(\cos\frac{2\pi}{3}+i\sin\frac{2\pi}{3}\right)$ D) $5\sqrt{3}\left(\cos\frac{5\pi}{6}+i\sin\frac{5\pi}{6}\right)$

6) $9\sqrt{3}-9i$ Express your answer in degrees. 6) _____

A) $\frac{9}{2}(\cos 300^\circ + i\sin 300^\circ)$ B) $\frac{9}{2}(\cos 330^\circ + i\sin 330^\circ)$

C) $18(\cos 330^\circ + i\sin 330^\circ)$ D) $18(\cos 300^\circ + i\sin 300^\circ)$

Express in standard notation.

7) $8(\cos 30^\circ + i\sin 30^\circ)$ 7) _____

A) $4+4\sqrt{3}i$ B) $\frac{\sqrt{3}}{4}+\frac{1}{4}i$ C) $4\sqrt{3}+4i$ D) $\frac{1}{4}+\frac{\sqrt{3}}{4}i$

8) $4(\cos(-135^\circ) + i\sin(-135^\circ))$ 8) _____

A) $-2\sqrt{2}+2\sqrt{2}i$ B) $-2\sqrt{2}-2\sqrt{2}i$ C) $-\sqrt{2}-\sqrt{2}i$ D) $-\sqrt{2}+\sqrt{2}i$

9) $9(\cos 180^\circ + i\sin 180^\circ)$ 9) _____

A) 9 B) $-9i$ C) -9 D) $9i$

10) $3(\cos 270^\circ + i\sin 270^\circ)$ 10) _____

A) -3 B) 3 C) $3i$ D) $-3i$

Find standard notation a + bi.

11) $\sqrt{3}\left(\cos\frac{\pi}{3}+i\sin\frac{\pi}{3}\right)$ 11) _____

A) $\frac{3}{2}+\frac{\sqrt{3}}{2}i$ B) $\frac{\sqrt{3}}{2}+\frac{1}{2}i$ C) $\frac{\sqrt{3}}{2}+\frac{3}{2}i$ D) $\frac{1}{2}+\frac{\sqrt{3}}{2}i$

Multiply or Divide and leave the answer in trigonometric notation.

12) $\frac{15(\cos 31^\circ + i\sin 31^\circ)}{3(\cos 5^\circ + i\sin 5^\circ)}$ 12) _____

A) $5(\cos 36^\circ + i\sin 36^\circ)$ B) $12\left(\cos\frac{31}{5}^\circ + i\sin\frac{31}{5}^\circ\right)$

C) $12(\cos 26^\circ - i\sin 26^\circ)$ D) $5(\cos 26^\circ + i\sin 26^\circ)$

13) $3(\cos 32^\circ + i\sin 32^\circ) \cdot 2(\cos 5^\circ + i\sin 5^\circ)$ 13) _____

A) $6(\cos 37^\circ + i\sin 37^\circ)$ B) $5(\cos 160^\circ + i\sin 160^\circ)$

C) $5(\cos 37^\circ + i\sin 37^\circ)$ D) $6(\cos 27^\circ + i\sin 27^\circ)$

14) $\dfrac{\frac{1}{7}\left(\cos\frac{2\pi}{3}+i\sin\frac{2\pi}{3}\right)}{\frac{1}{5}\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)}$ 14) _____

A) $\frac{1}{35}\left(\cos\frac{11\pi}{12}+i\sin\frac{11\pi}{12}\right)$ B) $\frac{5}{7}\left(\cos\frac{8}{3}+i\sin\frac{8}{3}\right)$

C) $\frac{5}{7}\left(\cos\frac{5\pi}{12}+i\sin\frac{5\pi}{12}\right)$ D) $\frac{7}{5}\left(\cos-\frac{5\pi}{12}+i\sin-\frac{5\pi}{12}\right)$

Convert to trigonometric notation and perform the indicated operation.

15) $\dfrac{2\sqrt{3}+2i}{\sqrt{3}-i}$ 15) _____

A) $\sqrt{3}i$ B) $\sqrt{3}$ C) $\sqrt{3}+i$ D) $1+\sqrt{3}i$

Raise the number to the indicated power and express in trigonometric notation.

16) $\left[2\left(\cos\frac{5}{6}\pi+i\sin\frac{5}{6}\pi\right)\right]^3$ 16) _____

A) $2\left(\cos\frac{5}{6}\pi+i\sin\frac{5}{6}\pi\right)$ B) $8\left(3\cos\frac{5}{6}\pi+i\,3\sin\frac{5}{6}\pi\right)$

C) $2\left(\cos\frac{5}{18}\pi+i\sin\frac{5}{18}\pi\right)$ D) $8\left(\cos\frac{5}{2}\pi+i\sin\frac{5}{2}\pi\right)$

17) $(-5-5i)^5$ 17) _____

A) $12{,}500\sqrt{2}\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)$ B) $100{,}000\left(\cos\frac{\pi}{20}+i\sin\frac{\pi}{20}\right)$

C) $100{,}000\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)$ D) $12{,}500\sqrt{2}\left(\cos\frac{\pi}{20}+i\sin\frac{\pi}{20}\right)$

Find the given power. Write the answer in standard form.

18) $[2(\cos 15^\circ + i\sin 15^\circ)]^4$ 18) _____

A) $8+8i\sqrt{3}$ B) $8+8i$ C) $16i$ D) $8\sqrt{3}+8i$

Find the indicated roots.

19) Cube roots of 8i 19) _____

A) $2i, \sqrt{3}+i, -\sqrt{3}+i$ B) $-2i, -\sqrt{3}-i, \sqrt{3}-i$

C) $2i, \sqrt{3}-i, -\sqrt{3}-i$ D) $-2i, \sqrt{3}+i, -\sqrt{3}+i$

20) Fifth roots of 1; trigonometric form 20) _____

A) $-1, \cos 36^\circ + i\sin 36^\circ, \cos 108^\circ + i\sin 108^\circ, \cos 252^\circ + i\sin 252^\circ, \cos 324^\circ + i\sin 324^\circ$

B) $1, \cos 36^\circ + i\sin 36^\circ, \cos 108^\circ + i\sin 108^\circ, \cos 252^\circ + i\sin 252^\circ, \cos 324^\circ + i\sin 324^\circ$

C) $1, \cos 72^\circ + i\sin 72^\circ, \cos 144^\circ + i\sin 144^\circ, \cos 216^\circ + i\sin 216^\circ, \cos 288^\circ + i\sin 288^\circ$

D) $-1, \cos 72^\circ + i\sin 72^\circ, \cos 144^\circ + i\sin 144^\circ, \cos 216^\circ + i\sin 216^\circ, \cos 288^\circ + i\sin 288^\circ$

Find all the complex solutions of the equation.

21) $x^4 + 16 = 0$ 21) _____

A) $8\sqrt{2} + 8\sqrt{2}i, 8\sqrt{2} - 8\sqrt{2}i, -8\sqrt{2} + 8\sqrt{2}i, -8\sqrt{2} - 8\sqrt{2}i$

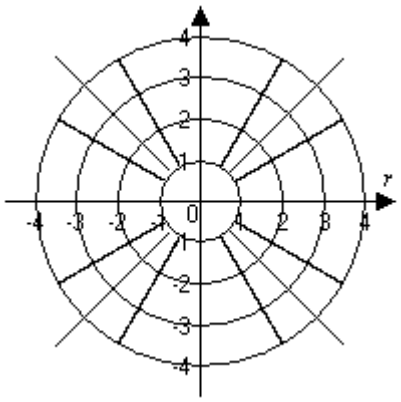
B) $2 + i, 2 - i, -2 + i, -2 - i$

C) $\sqrt{2} + \sqrt{2}i, \sqrt{2} - \sqrt{2}i, -\sqrt{2} + \sqrt{2}i, -\sqrt{2} - \sqrt{2}i$

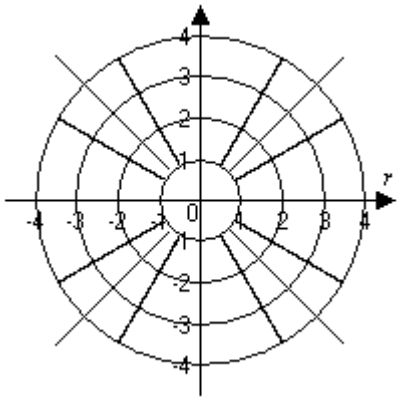
D) $1 + i, 1 - i, -1 + i, -1 - i$

Graph the point.

22) (2, 45°) 22) _____

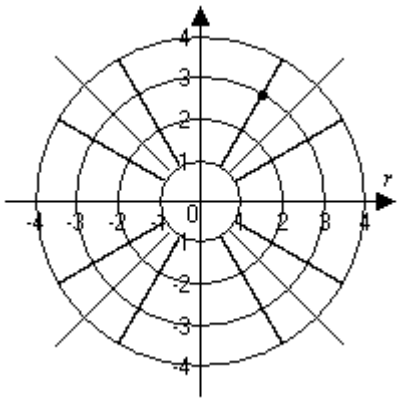


23) (−3, 750°) 23) _____



Find polar coordinates of the given point. Express the answer in degrees ($0 \le \theta < 360°$) or radians ($0 \le \theta < 2\pi$) as indicated.

24) Degrees 24) _____



Convert to polar coordinates. Express the answer in radians, using the smallest possible positive angle.

25) $(6, -6\sqrt{3})$ 25) _____

26) $(-7, 7)$ 26) _____

Find the polar coordinates of the point. Express the angle in degrees and then in radians, using the smallest possible positive angle.

27) $(4\sqrt{3}, 12)$ 27) _____

Convert to a polar equation.

28) $2x + 3y = 6$ 28) _____

A) $r(2 \cos \theta + 3 \sin \theta) = 6$ B) $r(2 \sin \theta + 3 \cos \theta) = 6$

C) $2 \sin \theta + 3 \cos \theta = 6r$ D) $2 \cos \theta + 3 \sin \theta = 6r$

29) $y^2 = 16x$ 29) _____

A) $\sin^2\theta = 16r^2\cos \theta$ B) $r \sin^2\theta = 16 \cos \theta$

C) $\sin^2\theta = 16r \cos \theta$ D) $r^2\sin^2\theta = 16 \cos \theta$

30) $x^2 + y^2 - 4x = 0$ 30) _____

A) $r \cos^2\theta = 4 \sin \theta$ B) $r = 4 \sin \theta$

C) $r \sin^2\theta = 4 \cos \theta$ D) $r = 4 \cos \theta$

31) $x^2 + y^2 = 9$ 31) _____

A) $r = 9$ B) $r = 3$

C) $r(\cos \theta + \sin \theta) = 3$ D) $r(\cos \theta + \sin \theta) = 9$

Convert to a rectangular equation.

32) $r = \dfrac{5}{1 + \cos \theta}$ 32) _____

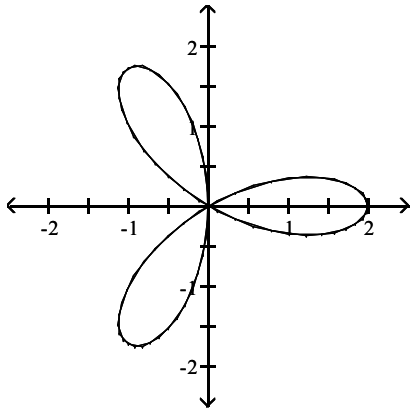
A) $y^2 = 10x - 25$ B) $y^2 = 25 - 10x$ C) $x^2 = 10y - 25$ D) $x^2 = 25 - 10y$

33) $r + r \sin \theta = 2$ 33) _____

A) $x + y = 4$ B) $x - 4y - 4 = 0$ C) $x^2 = 4 - 4y$ D) $x^2 = 4 + 4y$

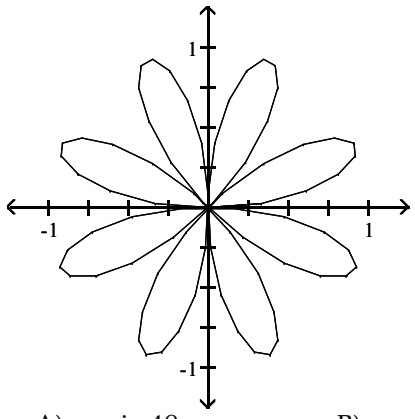
Use a calculator to choose the equation whose graph is shown.

34) 34) _____



A) $r = 3\cos 2\theta$ B) $r = 3\sin 2\theta$ C) $r = 2\cos 3\theta$ D) $r = 2\sin 3\theta$

35) 35) _____

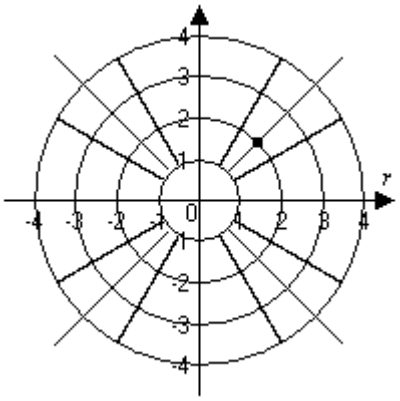


A) $r = \sin 4\theta$ B) $r = \sin 8\theta$ C) $r = \cos 4\theta$ D) $r = \cos 8\theta$

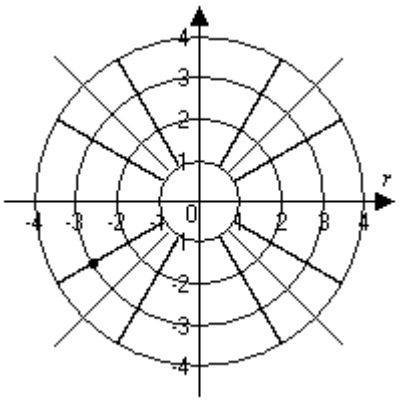
Find the polar coordinates of the point. Express the angle in degrees and then in radians, using the smallest possible positive angle.

36) $(-2\sqrt{2}, -2\sqrt{2})$ 36) _____

1) C
2) B
3) C
4) C
5) C
6) C
7) C
8) B
9) C
10) D
11) C
12) D
13) A
14) C
15) D
16) D
17) A
18) A
19) D
20) C
21) C
22)



23)



24) (3, 60°)

25) $\left(12, \frac{5\pi}{3}\right)$

26) $\left(7\sqrt{2}, \frac{3\pi}{4}\right)$

27) $(8\sqrt{3}, 60°), \left(8\sqrt{3}, \frac{\pi}{3}\right)$

28) A

29) B

30) D

31) B

32) B

33) C

34) C

35) A

36) $(4, 225°), \left(4, \frac{5\pi}{4}\right)$