Chapter 8

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Write the expression $\sqrt{-36} \cdot \sqrt{-25}$ in terms of i and then simplify.

a. -30
b. -35
c. 35
d. -24
e. 30

____ 2. Combine the complex numbers.

$(5 - 8i) - (2 - 4i)$

a. $4 - 5i$
b. $4 - 4i$
c. $3 - 5i$
d. $3 - 4i$
e. $4 + 5i$

____ 3. Find the product.

$(7 - 5i)^2$

a. $-26 - 72i$
b. $26 - 70i$
c. $26 - 72i$
d. $24 - 72i$
e. $24 - 70i$

____ 4. Find the product.

$(2 + 5i)(2 - 5i)$

a. $29 - 20i$
b. 29
c. 25
d. 27
e. $27 - 20i$

____ 5. Write the complex number in standard form.

$$8\left(\cos\frac{5\pi}{6}+i\sin\frac{5\pi}{6}\right)$$

a. $-4+4i\sqrt{3}$
b. $-4\sqrt{3}+4i$
c. $4+4i\sqrt{3}$
d. $4\sqrt{3}+4i$
e. $-4-4i\sqrt{3}$

____ 6. Use a calculator to help write the complex number in standard form. Round the numbers in your answer to the nearest hundredth.

$10\text{cis}5.9$

a. $9.27 - 3.78i$
b. $9.19 - 3.82i$
c. $9.31 - 3.78i$
d. $9.27 - 3.74i$
e. $9.31 - 3.74i$

____ 7. Multiply. Leave the answer in trigonometric form.

$4(\cos 20° + i\sin 20°)\cdot 7(\cos 35° + i\sin 35°)$

a. $28(\cos 55° + i\sin 55°)$
b. $24(\cos 50° + i\sin 50°)$
c. $28(\cos 45° + i\sin 45°)$
d. $24(\cos 55° + i\sin 55°)$
e. $28(\cos 50° + i\sin 50°)$

____ 8. Write z_1 and z_2 in trigonometric form and find their product.

$z_1 = -1+i\sqrt{3},\ z_2 = 1-i\sqrt{3}$

a. $2(\cos 330° + i\sin 330°)$
b. $2(\cos 30° + i\sin 30°)$
c. $4(\cos 240° + i\sin 240°)$
d. $4(\cos 150° + i\sin 150°)$
e. $4(\cos 60° + i\sin 60°)$

____ 9. Use DeMoivre's Theorem to find the following. Write your answer in standard form.

$$\left(\sqrt{2}\,\text{cis}\,\frac{9\pi}{20}\right)^5$$

a. $-4+4i$
b. $-16\sqrt{3}-16i$
c. $-4+4i\sqrt{3}$
d. $-16-16i\sqrt{3}$
e. $4+4i$

____ 10. Use DeMoivre's Theorem to find the following. Write your answer in standard form.

$$(-\sqrt{3}+i)^6$$

a. $8i$
b. $-16-16i\sqrt{3}$
c. -64
d. $-8-8i\sqrt{3}$
e. 64

____ 11. Find the quotient $\frac{z_1}{z_2}$ in standard form.

$z_1 = 8+8i, z_2 = 4+4i$

a. 2
b. -2
c. -7
d. $-2i$
e. 7

____ 12. Write z_1 and z_2 in trigonometric form and then find their quotient.

$z_1 = 3\sqrt{3} - 3i, z_2 = 6i$

a. $\cos 330° + i\sin 330°$
b. $\cos 120° + i\sin 120°$
c. $2(\cos 60° + i\sin 60°)$
d. $2(\cos 180° + i\sin 180°)$
e. $\cos 240° + i\sin 240°$

____ 13. Convert complex numbers to trigonometric form and then simplify the expression. Write the answer in standard form.

$$\frac{(1-i)^4 (i)^2}{-2+2i}$$

a. $-16+16i$
b. $-1-i$
c. $-16-16i$
d. $4-4i$
e. $-4+4i$

____ 14. DeMoivre's Theorem can be used to find reciprocals of complex numbers. Recall from algebra that the reciprocal of x is $\frac{1}{x}$, which can be expressed as x^{-1}.

Use this fact, along with DeMoivre's Theorem, to find the reciprocal of the number below.

$1-i$

a. $\frac{1}{4}+\frac{\sqrt{3}}{4}i$

b. $-\frac{1}{2}-\frac{1}{2}i$

c. $\frac{1}{2}+\frac{1}{2}i$

d. $-\frac{1}{4}-\frac{\sqrt{3}}{4}i$

e. $-\frac{\sqrt{3}}{4}-\frac{1}{4}i$

____ 15. Find two square roots for the complex number. Write your answer in standard form.

$-2+2i\sqrt{3}$

a. $\sqrt{3}+i, -\sqrt{3}-i$

b. $1+i\sqrt{3}, -1-i\sqrt{3}$

c. $\sqrt{2}+i\sqrt{2}, -1\sqrt{2}-i\sqrt{2}$

d. $-1+i\sqrt{3}, 1-i\sqrt{3}$

e. $-\sqrt{3}+i, \sqrt{3}-i$

____ 16. Find two square roots for the complex number. Write your answer in standard form.

-64

a. $8i, -8$

b. $64i, -64i$

c. $8, -8$

d. $8, -8i$

e. $8i, -8i$

____ 17. Find three cube roots for the complex number. Leave your answers in trigonometric form.

$27(\cos 297° + i \sin 297°)$

a. $3 \operatorname{cis} 97°, 3 \operatorname{cis} 217°, 3 \operatorname{cis} 337°$

b. $3 \operatorname{cis} 98°, 3 \operatorname{cis} 218°, 3 \operatorname{cis} 338°$

c. $3 \operatorname{cis} 99°, 3 \operatorname{cis} 219°, 3 \operatorname{cis} 339°$

d. $4 \operatorname{cis} 97°, 4 \operatorname{cis} 217°, 4 \operatorname{cis} 337°$

e. $4 \operatorname{cis} 99°, 4 \operatorname{cis} 219°, 4 \operatorname{cis} 339°$

____ 18. Find 4 fourth roots of $z = 1,296\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)$. Write each root in standard form.

a. $1 + i\sqrt{3}, -\sqrt{3} + i, -1 - i\sqrt{3}, \sqrt{3} - i$

b. $3 + 3i\sqrt{3}, -3\sqrt{3} + 3i, -3 - 3i\sqrt{3}, 3\sqrt{3} - 3i$

c. $\sqrt{3} + i, -1 + i\sqrt{3}, -\sqrt{3} - i, 1 - i\sqrt{3}$

d. $3\sqrt{3} + 3i, -3 + 3i\sqrt{3}, -3\sqrt{3} - 3i, 3 - 3i\sqrt{3}$

e. $3\sqrt{2} + 3i\sqrt{2}, -3\sqrt{2} + 3i\sqrt{2}, -3\sqrt{2} - 3i\sqrt{2}, 3\sqrt{2} - 3i\sqrt{2}$

____ 19. Find the 4 fourth roots of

$$z = \cos\frac{10\pi}{9} + i\sin\frac{10\pi}{9}$$

a. $\operatorname{cis}\frac{\pi}{4}, \operatorname{cis}\frac{3\pi}{4}, \operatorname{cis}\frac{5\pi}{4}, \operatorname{cis}\frac{7\pi}{4}$

b. $\operatorname{cis}\frac{5\pi}{36}, \operatorname{cis}\frac{7\pi}{18}, \operatorname{cis}\frac{23\pi}{36}, \operatorname{cis}\frac{8\pi}{9}$

c. $\operatorname{cis}\frac{13\pi}{36}, \operatorname{cis}\frac{31\pi}{36}, \operatorname{cis}\frac{49\pi}{36}, \operatorname{cis}\frac{67\pi}{36}$

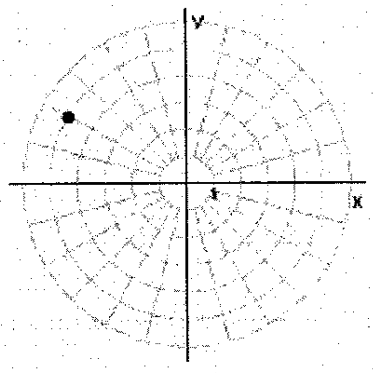
d. $\operatorname{cis}\frac{13\pi}{72}, \operatorname{cis}\frac{31\pi}{72}, \operatorname{cis}\frac{49\pi}{72}, \operatorname{cis}\frac{67\pi}{72}$

e. $\operatorname{cis}\frac{5\pi}{18}, \operatorname{cis}\frac{7\pi}{9}, \operatorname{cis}\frac{23\pi}{18}, \operatorname{cis}\frac{16\pi}{9}$

____ 20. Graph the ordered pair on a polar coordinate system.

$(5, 150°)$

a.



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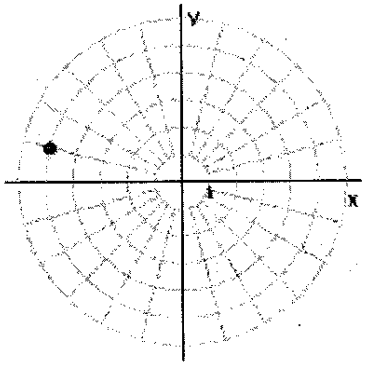

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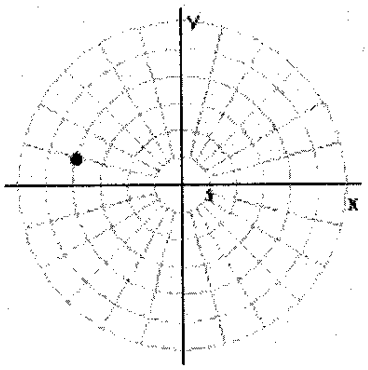

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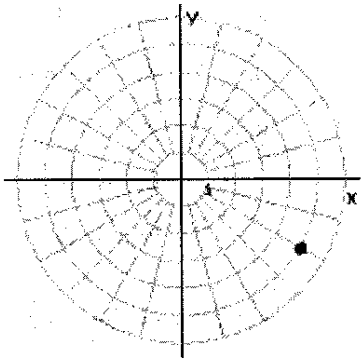
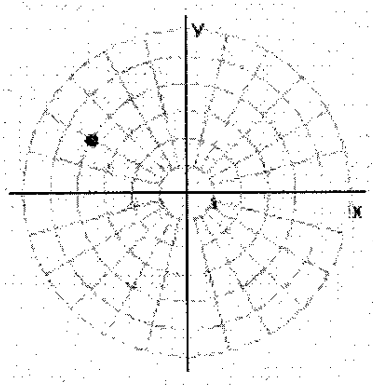


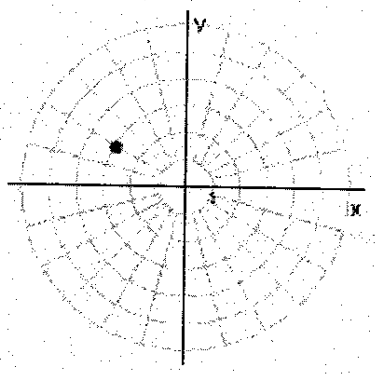
e.



____ 21. Graph the ordered pair on a polar coordinate system.

$(4, -210°)$

a.



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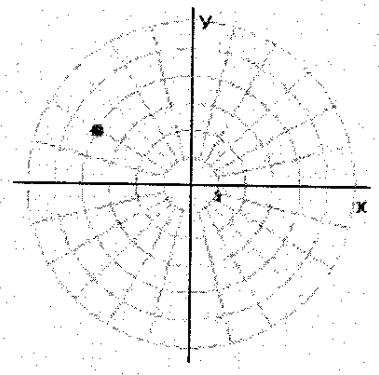

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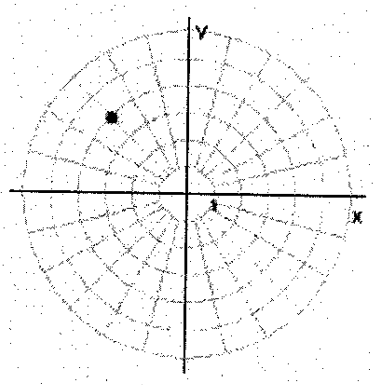
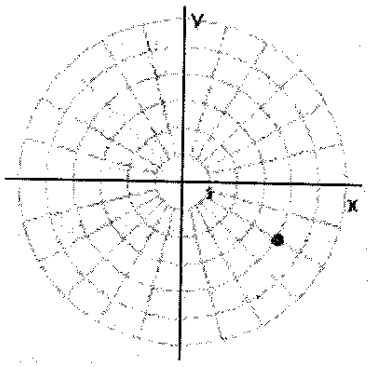


d.



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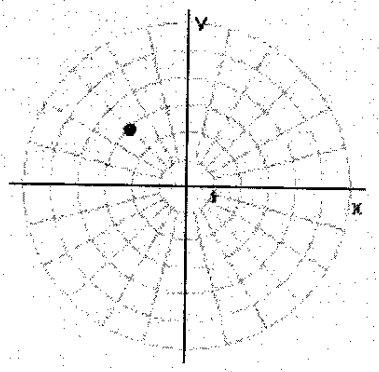


____ 22. Convert to rectangular coordinates. Use exact values.

$\left(9, \frac{\pi}{2}\right)$

a. (0, 9)
b. (0, - 8)
c. (0, 7)
d. (0, - 9)
e. (0, 8)

____ 23. Write the equation with rectangular coordinates.

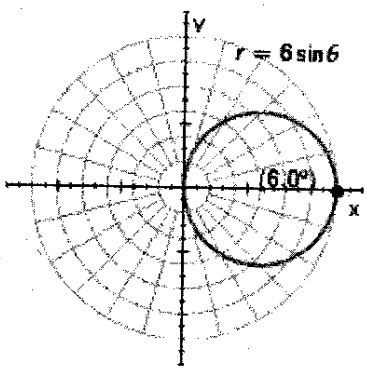
$r = 7\cos\theta$

a. $x^2 - y^2 = 6x$
b. $x^2 + y^2 = 7x$
c. $x^2 - y^2 = 7x$
d. $x^2 + y^2 = 6x$
e. $x^2 + y = 7x$

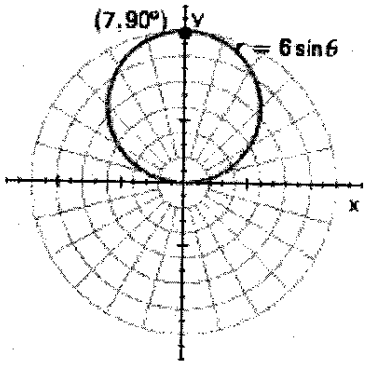
____ 24. Convert the equation to polar coordinates and then sketch the graph.

$x^2 + y^2 = 6x$

a.



b.



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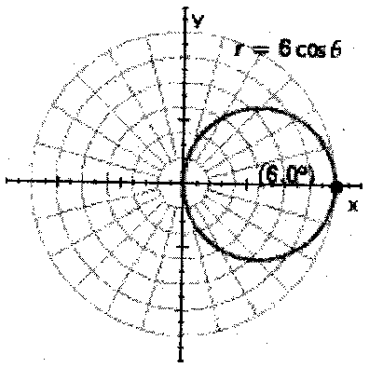
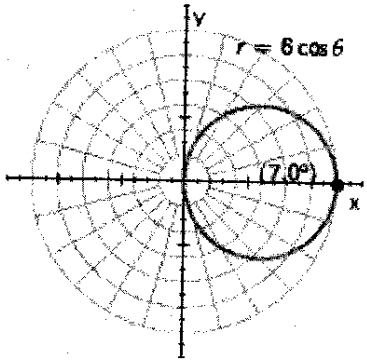
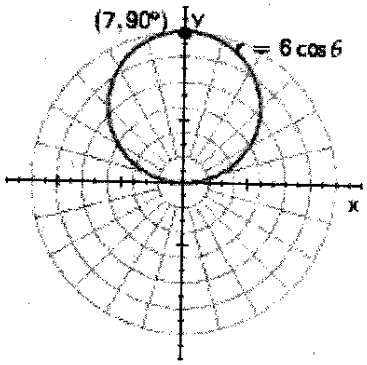


d.



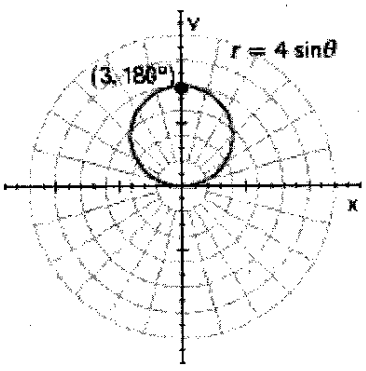
e.



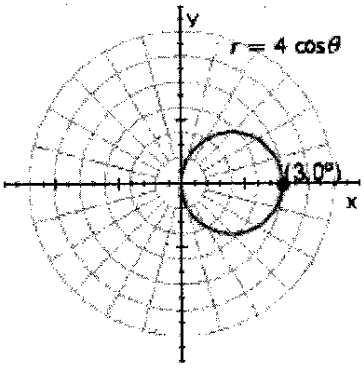
____ 25. Convert the equation to polar coordinates and then sketch the graph.

$x^2 + y^2 = 4y$

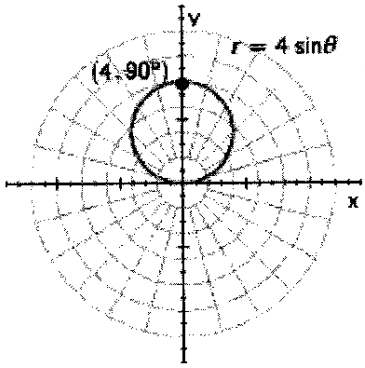
a.



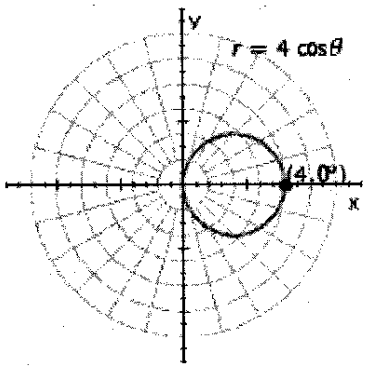
b.



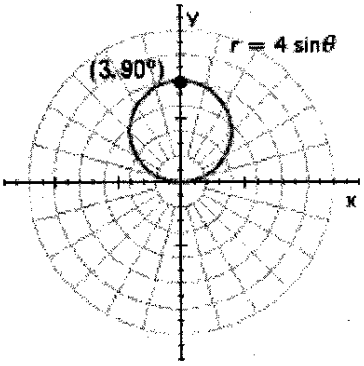
c.



d.



e.



Chapter 8
Answer Section

MULTIPLE CHOICE

1.	ANS: A	PTS: 1
2.	ANS: D	PTS: 1
3.	ANS: E	PTS: 1
4.	ANS: B	PTS: 1
5.	ANS: B	PTS: 1
6.	ANS: D	PTS: 1
7.	ANS: A	PTS: 1
8.	ANS: E	PTS: 1
9.	ANS: E	PTS: 1
10.	ANS: C	PTS: 1
11.	ANS: A	PTS: 1
12.	ANS: E	PTS: 1
13.	ANS: B	PTS: 1
14.	ANS: C	PTS: 1
15.	ANS: B	PTS: 1
16.	ANS: E	PTS: 1
17.	ANS: C	PTS: 1
18.	ANS: D	PTS: 1
19.	ANS: E	PTS: 1
20.	ANS: A	PTS: 1
21.	ANS: B	PTS: 1
22.	ANS: A	PTS: 1
23.	ANS: B	PTS: 1
24.	ANS: C	PTS: 1
25.	ANS: C	PTS: 1

Chapter 8

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Write the expression $\sqrt{-36} \cdot \sqrt{-16}$ in terms of i and then simplify.

a. 24
b. – 28
c. 28
d. – 24
e. - 18

____ 2. Combine the complex numbers.

$(10 - 8i) - (2 - 3i)$

a. $8 - 5i$
b. $7 - 5i$
c. $7 + 6i$
d. $8 - 6i$
e. $7 - 6i$

____ 3. Find the product.

$(7 - 5i)^2$

a. $24 - 70i$
b. $26 - 72i$
c. $- 26 - 72i$
d. $24 - 72i$
e. $26 - 70i$

____ 4. Find the product.

$(2 + 7i)(2 - 7i)$

a. 49
b. $53 - 28i$
c. 51
d. $51 - 28i$
e. 53