Final Exam Review Supplement
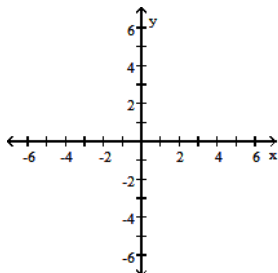Use this review and the first 4 exams to study for the final exam

Name_____
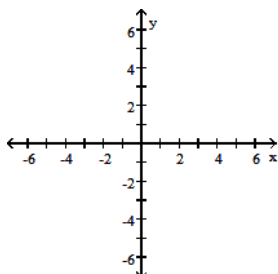
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the complex number.

1) -3 - 6i

2) – + i

Find sum of the pair of complex numbers.

3) -6 - 5i,   + 3i

4)   + 6i, -4

Write the complex number in rectangular form.

5) 4(cos 5° + i sin 5°)

6) $3\left(\cos\dfrac{\pi}{3} + i\sin\dfrac{\pi}{3}\right)$

7) 6(cos 330° + i sin 330°)

Write the complex number in trigonometric form r(cos θ + i sin θ), with θ in the interval [0°, 360°).

8) 4i

9) $5\sqrt{3}$ + 5i

Find the product. Write the product in rectangular form, using exact values.

10) [7(cos 45° + i sin 45°)] [2(cos 90° + i sin 90°)]

11) [8(cos 330° + i sin 330°)] [6(cos 330° + i sin 330°)]

Find the quotient and write in rectangular form. First convert the numerator and denominator to trigonometric form.

12) $\dfrac{5(\cos 200° + i\sin 200°)}{4(\cos 50° + i\sin 50°)}$

13) $\dfrac{4(\cos 120° + i\sin 120°)}{5(\cos 60° + i\sin 60°)}$

Solve the problem.

14) The current I in a circuit with voltage E, resistance R, capacitive reactance X_C and inductive reactance X_L is

$$I = \frac{E}{R + (X_L - X_C)\,i}$$

Find I if E = $2\sqrt{2}$(cos 45° + i sin 45°), R = 5, X_L = 7, and X_C = 5.
Give your answer in rectangular form.

Find the given power. Write answer in rectangular form.

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

16) $(2 - 2i)^5$

17) $(\cos 30° + i\sin 30°)^{12}$

1

Find all cube roots of the complex number. Leave answers in trigonometric form.

18) $27(\cos 225° + i \sin 225°)$

19) $27i$

20) $-3\sqrt{3} - 3i$

Find all specified roots.
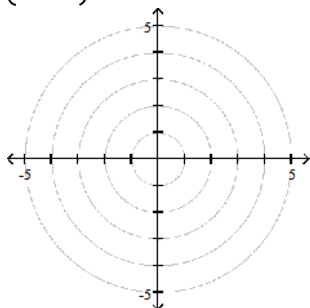
21) Fifth roots of 1.

Find all solutions of the equation. Leave answers in trigonometric form.

22) $x^3 - 8 = 0$

23) $x^3 + 8i = 0$

Plot the point.

24) $\left(2, \dfrac{7\pi}{4}\right)$

Give the rectangular coordinates for the point.

25) $(5, 330°)$

26) $(-3, 120°)$

The rectangular coordinates of a point are given. Express the point in polar coordinates with $r \geq 0$ and $0° \leq \theta < 360°$.

27) $(2, -2)$

28) $\left(\dfrac{1}{4}, \dfrac{\sqrt{3}}{4}\right)$

Determine two pairs of polar coordinates for the point with $0° \leq \theta < 360°$.

29) $(4, -4)$

30) $(5\sqrt{3}, 15)$

For the given rectangular equation, give its equivalent polar equation.

31) $x - y = 15$

32) $8x - 7y = -12$
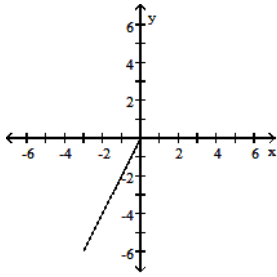
Find an equivalent equation in rectangular coordinates.

33) $r = \cos \theta$

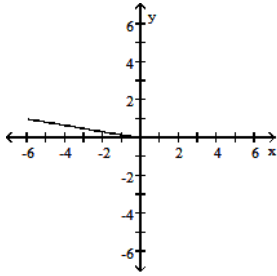34) $r(\cos \theta - \sin \theta) = 5$

1)

2)

3) $-2i$

4) $-2 + 6i$

5) $4 + 0.3i$

6) $\dfrac{3}{2} + \dfrac{3\sqrt{3}}{2}i$

7) $3\sqrt{3} - 3i$

8) $4(\cos 90° + i \sin 90°)$

9) $10(\cos 30° + i \sin 30°)$

10) $-7\sqrt{2} + 7\sqrt{2}i$

11) $24 - 24\sqrt{3}i$

12) $-\dfrac{5\sqrt{3}}{8} + \dfrac{5}{8}i$

13) $\dfrac{2}{5} + \dfrac{2}{5}i\sqrt{3}$

14) $\dfrac{14}{29} + \dfrac{6}{29}i$

15) -64

16) $-128 + 128i$

17) 1

18) $3 \text{ cis } 75°, 3 \text{ cis } 195°, 3 \text{ cis } 315°$

19) $3 \text{ cis } 30°, 3 \text{ cis } 150°, 3 \text{ cis } 270°$

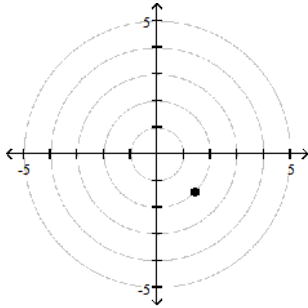20) $\sqrt[3]{6} \text{ cis } 70°, \sqrt[3]{6} \text{ cis } 190°, \sqrt[3]{6} \text{ cis } 310°$

21) $1, \text{cis } \dfrac{2\pi}{5}, \text{cis } \dfrac{4\pi}{5}, \text{cis } \dfrac{6\pi}{5}, \text{cis } \dfrac{8\pi}{5}$

22) $\{2, 2 \text{ cis } 120°, 2 \text{ cis } 240°\}$

23) $\{2 \text{ cis } 90°, 2 \text{ cis } 210°, 2 \text{ cis } 330°\}$

24)

25) $\left(\dfrac{5\sqrt{3}}{2}, -\dfrac{5}{2} \right)$

26) $\left(\dfrac{3}{2}, -\dfrac{3\sqrt{3}}{2} \right)$

27) $(2\sqrt{2}, 315°)$

28) $\left(\dfrac{1}{2}, 60° \right)$

29) $(4\sqrt{2}, 315°), (-4\sqrt{2}, 135°)$

30) $(10\sqrt{3}, 60°), (-10\sqrt{3}, 240°)$

31) $r = \dfrac{15}{\cos\theta - \sin\theta}$

32) $r = \dfrac{-12}{8\cos\theta - 7\sin\theta}$

33) $x^2 + y^2 = x$

34) $x - y = 5$