

Question

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Description

This is the review for Exam #3. Please work as many problems as possible before we review in-class. As always, if you need anything, please email me
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1. Question Details

SPreCalc6 7.1.004. [2703858]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\cos t \csc t$$

$$\cot t$$

2. Question Details

SPreCalc6 7.1.009. [2703875]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\sin u \tan u + \cos u$$

$$\sec u$$

3. Question Details

SPreCalc6 7.1.010. [2705111]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\sin^2 \theta (1 + \cot^2 \theta)$$

$$1$$

4. Question Details

SPreCalc6 7.1.011. [2703846]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\frac{\csc \theta - \sin \theta}{\cos \theta}$$

$$\cot \theta$$

5. Question Details

SPreCalc6 7.1.015. [2703802]

Simplify the trigonometric expression.

$$\frac{\cos y + 1}{1 + \sec y}$$

$$\cos y$$

6. Question Details

SPreCalc6 7.1.017. [2703798]

Simplify the trigonometric expression.

$$\frac{\csc^2 x - 1}{\csc^2 x}$$

$$\cos^2 x$$

7. Question Details

SPreCalc6 7.1.058. [1719003]

Verify the identity.

$$\frac{\sin w}{\cos w + \sin w} = \frac{\tan w}{\tan w + 1}$$

Key: Show your work.

8. Question Details

SPreCalc6 7.1.062. [1719017]

Verify the identity.

$$\frac{1 + \sec^2 x}{1 + \tan^2 x} = 1 + \cos^2 x$$

Key: Show your work.

9. Question Details

SPreCalc6 7.1.066. [1719027]

Verify the identity.

$$\frac{\sin A}{1 + \cos A} + \cot A = \csc A$$

Key: Show your work.

Verify the identity.

$$\frac{1 + \cot x}{1 - \cot x} = \frac{\tan x + 1}{\tan x - 1}$$

Key: Show your work.

Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in [Example 1](#).

$\sin 105^\circ$

$$\frac{\sqrt{6} + \sqrt{2}}{4}$$

Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in [Example 1](#).

$\cos 165^\circ$

$$-\frac{\sqrt{6} + \sqrt{2}}{4}$$

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$\sin 12^\circ \cos 48^\circ + \cos 12^\circ \sin 48^\circ$

$$\sin 60^\circ$$

Find its exact value.

$$\frac{\sqrt{3}}{2}$$

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$\cos \frac{3\pi}{5} \cos \frac{4\pi}{15} + \sin \frac{3\pi}{5} \sin \frac{4\pi}{15}$

$$\cos \frac{\pi}{3}$$

Find its exact value.

$$\frac{1}{2}$$

15. Question Details

SPreCalc6 7.2.034.MI. [2678438]

Prove the identity.

$$\cos(x + y) + \cos(x - y) = 2 \cos x \cos y$$

Key: $\cos(x + y) + \cos(x - y) = \cos x \cos y - \sin x \sin y + \cos x \cos y + \sin x \sin y = 2 \cos x \cos y$

16. Question Details

SPreCalc6 7.2.036. [1759351]

Prove the identity.

$$\cot(x + y) = \frac{\cot y \cot x - 1}{\cot y + \cot x}$$

Key: Show your work.

17. Question Details

SPreCalc6 7.3.004. [2708211]

Find $\sin 2x$, $\cos 2x$, and $\tan 2x$ from the given information.

$$\tan x = -\frac{15}{8}, \quad x \text{ in Quadrant II}$$

$$\sin 2x = \frac{-240}{289}$$

$$\cos 2x = \frac{-161}{289}$$

$$\tan 2x = \frac{240}{161}$$

18. Question Details

SPreCalc6 7.3.006.MI. [2678458]

Find $\sin 2x$, $\cos 2x$, and $\tan 2x$ from the given information.

$$\csc x = 6, \quad \tan x < 0$$

$$\sin 2x = \frac{-\sqrt{35}}{18}$$

$$\cos 2x = \frac{17}{18}$$

$$\tan 2x = \frac{-\sqrt{35}}{17}$$

19. Question Details

SPreCalc6 7.3.009. [2708228]

Find $\sin 2x$, $\cos 2x$, and $\tan 2x$ from the given information.

$$\tan x = -\frac{1}{3}, \quad \cos x > 0$$

$$\sin 2x = \boxed{-\frac{3}{5}}$$

$$\cos 2x = \boxed{\frac{4}{5}}$$

$$\tan 2x = \boxed{-\frac{3}{4}}$$

20. Question Details

SPreCalc6 7.3.017. [2709806]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\cos 15^\circ$$

$$\boxed{\frac{\sqrt{2+\sqrt{3}}}{2}}$$

21. Question Details

SPreCalc6 7.3.025. [2709702]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\sin \frac{\pi}{12}$$

$$\boxed{\frac{\sqrt{2-\sqrt{3}}}{2}}$$

22. Question Details

SPreCalc6 8.1.030. [2694693]

Find the rectangular coordinates for the point whose polar coordinates are given.

$$\left(-1, \frac{5\pi}{2}\right)$$

$$(x, y) = \left(\boxed{0}, \boxed{-1} \right)$$

23. Question Details

SPreCalc6 8.1.031. [2694689]

Find the rectangular coordinates for the point whose polar coordinates are given.

$$(7, 7\pi)$$

$$(x, y) = \left(\boxed{-7}, \boxed{0} \right)$$

24. Question Details

SPreCalc6 8.1.033. [2694712]

Find the rectangular coordinates for the point whose polar coordinates are given.

$$\left(8\sqrt{2}, \frac{11\pi}{6}\right)$$

$$(x, y) = \left(\boxed{4\sqrt{6}}, \boxed{-4\sqrt{2}} \right)$$

25. Question Details

SPreCalc6 8.1.034. [2694700]

Find the rectangular coordinates for the point whose polar coordinates are given.

$$\left(\sqrt{3}, -\frac{5\pi}{3}\right)$$

$$(x, y) = \left(\frac{\sqrt{3}}{2}, \frac{3}{2} \right)$$

26. Question Details

SPreCalc6 8.1.035-042.501.XP.MI. [1870983]

A point in rectangular coordinates is given. Convert the point to polar coordinates ($r > 0$, $0 \leq \theta < 2\pi$).

$$(-7, -7)$$

$$(r, \theta) = \left(7\sqrt{2}, \frac{5\pi}{4} \right)$$

27. Question Details

SPreCalc6 8.1.035. [2694697]

Convert the rectangular coordinates to polar coordinates with $r > 0$ and $0 \leq \theta < 2\pi$.

$$(6, -6)$$

$$(r, \theta) = \left(6\sqrt{2}, \frac{7\pi}{4} \right)$$

28. Question Details

SPreCalc6 8.1.036.MI. [2705979]

Convert the rectangular coordinates to polar coordinates with $r > 0$ and $0 \leq \theta < 2\pi$.

$$(9\sqrt{3}, -9)$$

$$(r, \theta) = \left(18, \frac{11\pi}{6} \right)$$

29. Question Details

SPreCalc6 8.1.038. [2694694]

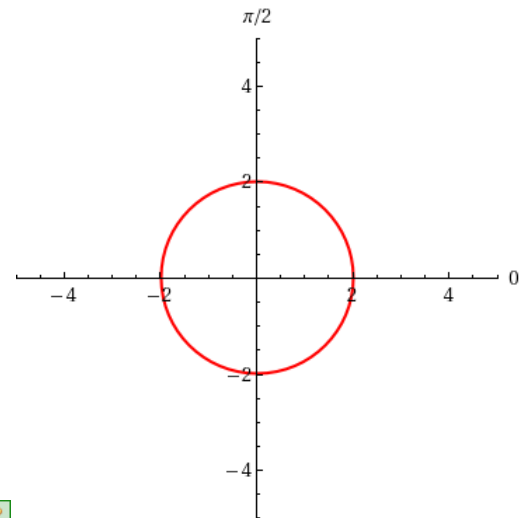
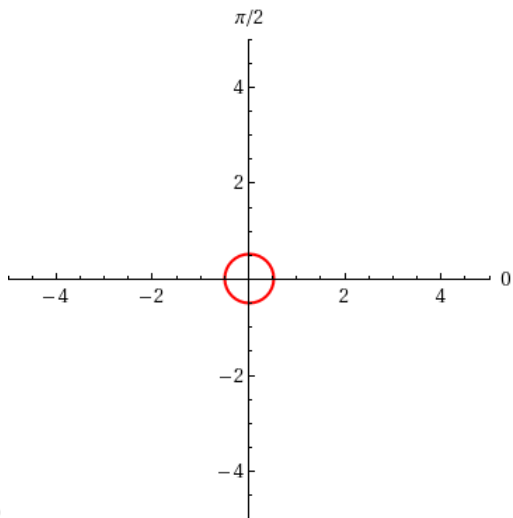
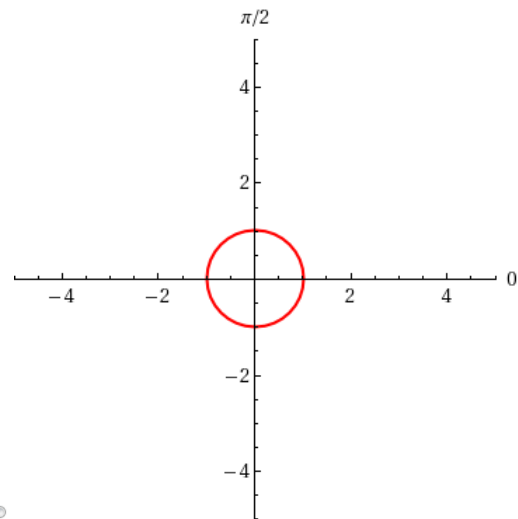
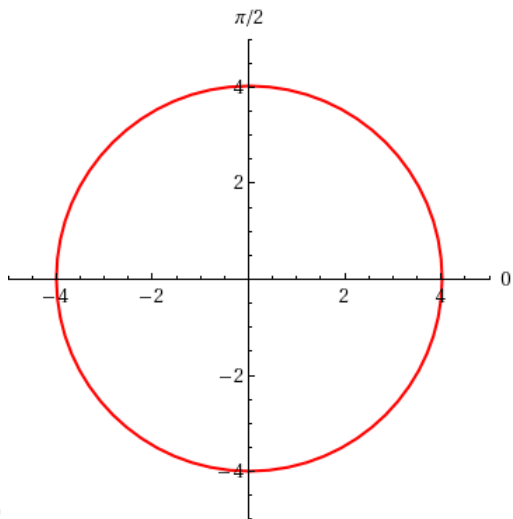
Convert the rectangular coordinates to polar coordinates with $r > 0$ and $0 \leq \theta < 2\pi$.

$$(-\sqrt{6}, -\sqrt{2})$$

$$(r, \theta) = \left(2\sqrt{2}, \frac{7\pi}{6} \right)$$

Sketch a graph of the polar equation.

$$r = 2$$

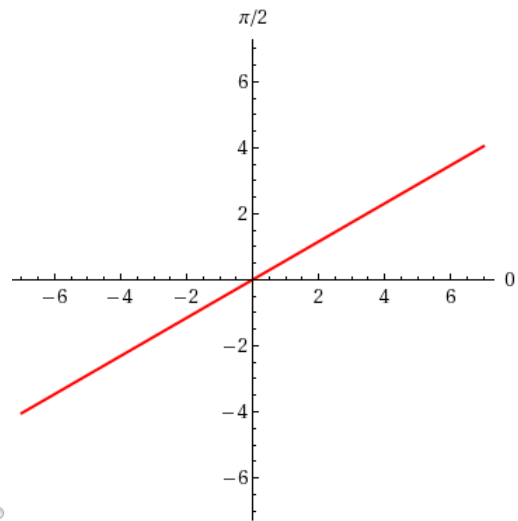
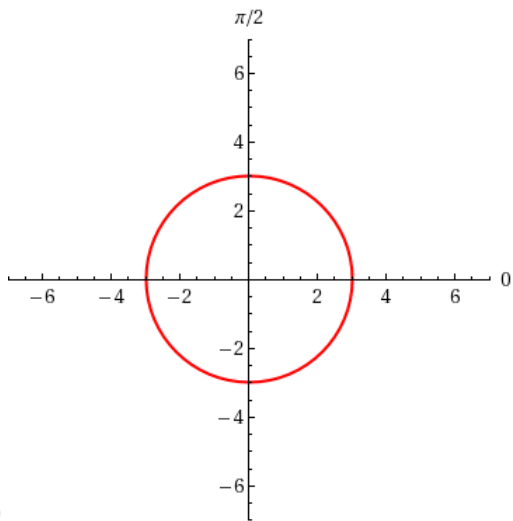
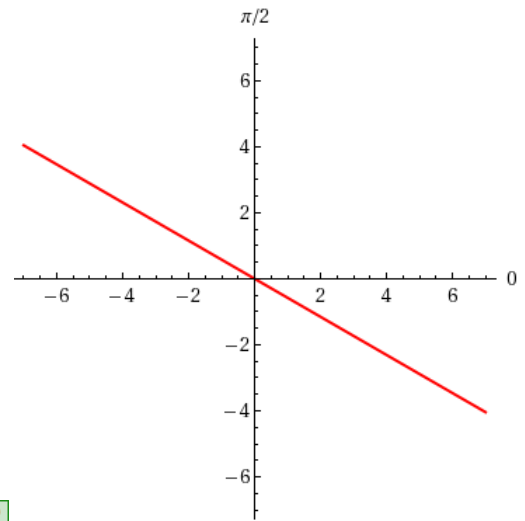
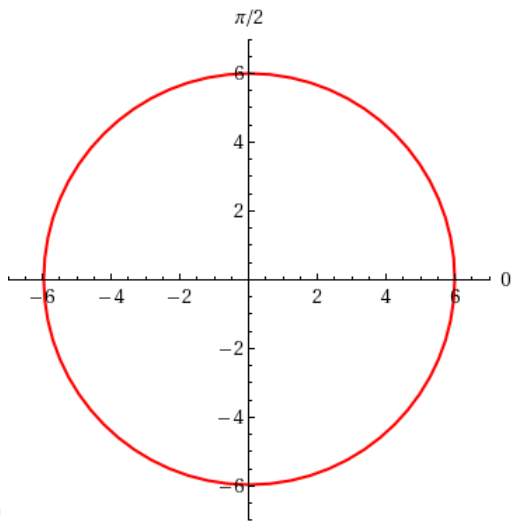


Express the equation in rectangular coordinates. (Use variables x and y .)

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

Sketch a graph of the polar equation.

$$\theta = \frac{5\pi}{6}$$



Express the equation in rectangular coordinates. (Use variables x and y .)

$$y = -\frac{\sqrt{3}}{3}x$$

Write the complex number in polar form with argument θ between 0 and 2π .

$$8 + 8i$$

$$8\sqrt{2} \left(\cos \left(\frac{\pi}{4} \right) + i \sin \left(\frac{\pi}{4} \right) \right)$$

33. Question Details

SPreCalc6 8.3.030.MI. [2678942]

Write the complex number in polar form with argument θ between 0 and 2π .

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

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

34. Question Details

SPreCalc6 8.3.032. [1785268]

Write the complex number in polar form with argument θ between 0 and 2π .

$$6 - 6i$$

$$6\sqrt{2} \left(\cos \left(\frac{7\pi}{4} \right) + i \sin \left(\frac{7\pi}{4} \right) \right)$$

35. Question Details

SPreCalc6 8.3.033. [1785363]

Write the complex number in polar form with argument θ between 0 and 2π .

$$5\sqrt{3} - 5i$$

$$10 \left(\cos \left(\frac{11\pi}{6} \right) + i \sin \left(\frac{11\pi}{6} \right) \right)$$

36. Question Details

SPreCalc6 8.3.069. [1741069]

Find the indicated power using De Moivre's Theorem. (Express your fully simplified answer in the form $a + bi$.)

$$(1 + i)^{20}$$

$$-1024$$

37. Question Details

SPreCalc6 8.3.070. [1768884]

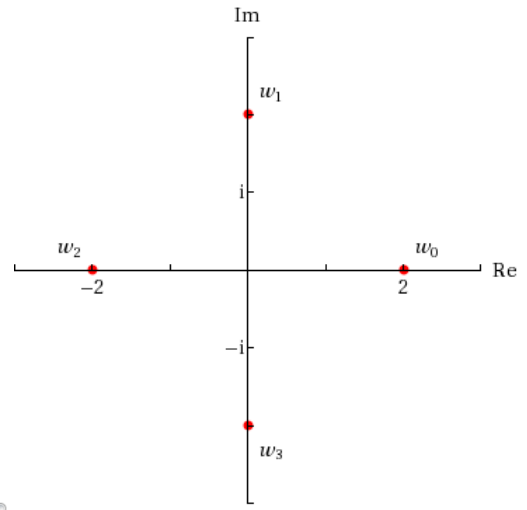
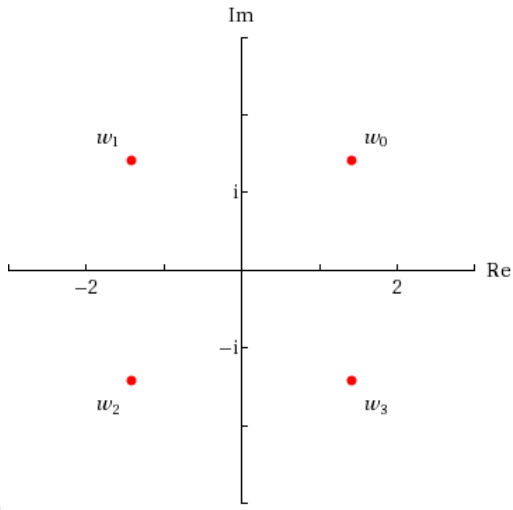
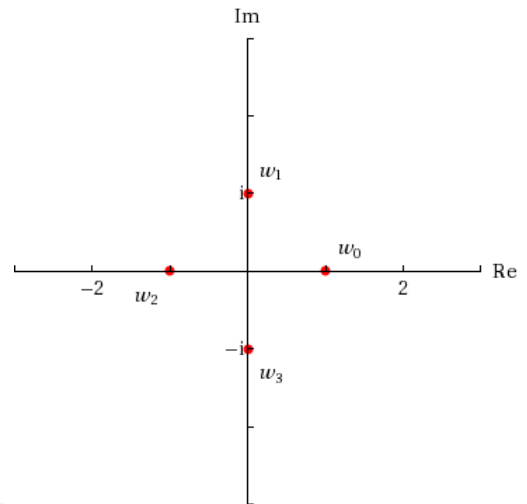
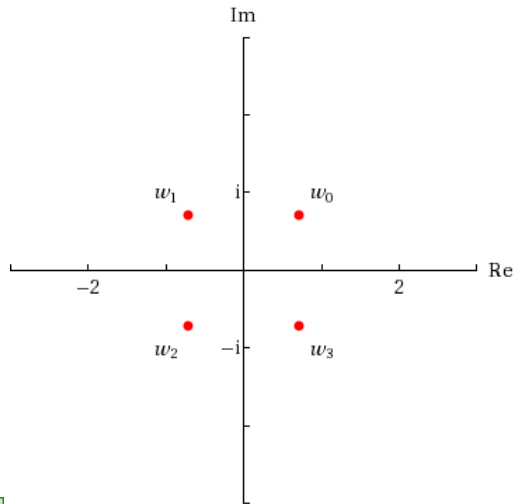
Find the indicated power using De Moivre's Theorem. (Express your fully simplified answer in the form $a + bi$.)

$$(1 - \sqrt{3}i)^5$$

$$16 + 16i\sqrt{3}$$

Find the indicated roots and graph them in the complex plane.

The fourth roots of -1



Referring to the labels from the graph you selected above, give the exact roots. (Express θ in radians.)

$$w_0 = \frac{\sqrt{2}}{2} + \frac{i\sqrt{2}}{2}$$

$$w_1 = -\frac{\sqrt{2}}{2} + \frac{i\sqrt{2}}{2}$$

$$w_2 = -\frac{\sqrt{2}}{2} - \frac{i\sqrt{2}}{2}$$

$$w_3 = \frac{\sqrt{2}}{2} - \frac{i\sqrt{2}}{2}$$