

PreCalculus
Final Exam Review

Name _____
Date _____ Block _____

Chapter 5 (Sections 5.3 – 5.5)

1. Find all solutions for the variable in the interval $[0, 2\pi)$.

a.) $2\sin^2 x + 3\cos x - 3 = 0$

c.) $3\tan^3 x - \tan x = 0$

b.) $2\cos^2 x = \cos x$

d.) $\sin 2x - \cos x = 0$

2. Use half-angle formulas to find the exact value.

a.) $\cos\left(\frac{\pi}{8}\right)$

b.) $\tan\left(\frac{3\pi}{8}\right)$

c.) $\sin\left(\frac{\pi}{12}\right)$

3. Write the expression as the sine, cosine, or tangent of an angle.

a.) $\cos 60^\circ \cos 10^\circ - \sin 60^\circ \sin 10^\circ$

b.) $\frac{\tan 152^\circ - \tan 47^\circ}{1 + \tan 152^\circ \tan 47^\circ}$

c.) $\sin \frac{4\pi}{9} \cos \frac{\pi}{8} + \cos \frac{4\pi}{9} \sin \frac{\pi}{8}$

4. Verify each identity.

a.) $\cos\left(\theta + \frac{\pi}{2}\right) - \cos\left(\theta - \frac{\pi}{2}\right) = -2\sin\theta$

b.) $\sec 2x = \frac{\sec^2 x}{2 - \sec^2 x}$

c.) $\frac{\cos x + \cos 3x}{\sin 3x - \sin x} = \cot x$

d.) $(\sin x + \cos x)^2 = 1 + \sin 2x$

Chapter 6

In 5 - 7, solve the triangle for all angles and sides. If two solutions exist, find both.

5. $c = 13, b = 8, B = 31^\circ$

6. $A = 55^\circ, b = 12, c = 7$

7. $A = 33^\circ, B = 70^\circ, b = 7$

In 8 - 9, find the area of the triangle to the nearest tenth.

8. $A = 52^\circ, b = 14 \text{ m}, c = 21 \text{ m}$

9. $a = 7 \text{ cm}, b = 8 \text{ cm}, c = 9 \text{ cm}$

Chapter 9

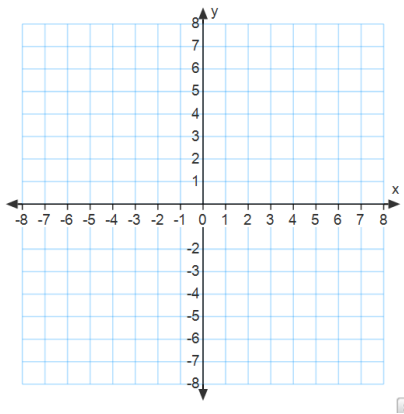
In 10 - 12, write the equation in standard form and then classify the graph as a parabola, circle, ellipse, or hyperbola.

10. $x^2 + y^2 - 6x + 4y + 9 = 0$

11. $x^2 - 6x + 16y + 21 = -4y^2$

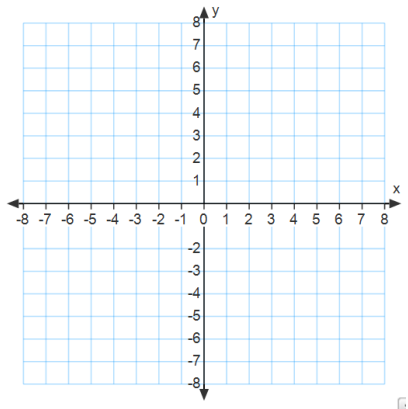
12. $y^2 - 6y - 4x + 21 = 0$

13. Find the vertex, axis of symmetry, focus, and directrix of the parabola and sketch its graph.



$$\left(x + \frac{1}{2}\right)^2 = 4(y - 1)$$

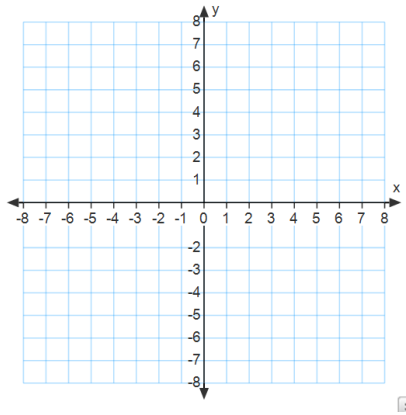
14. Identify the conic as a circle or ellipse. Then find the center and radius (if it's a circle); find the center, vertices, co-vertices, and foci (if it's an ellipse). Sketch its graph.



$$9x^2 + 4y^2 + 36x - 24y + 36 = 0$$

15. Find the center, vertices, foci, lines containing the axes, and the equations of the asymptotes of the hyperbola, and then sketch its graph.

$$x^2 - 9y^2 + 36y - 72 = 0$$



16. Write the equation of a circle that has a center at $(-1, 3)$ and passes through the point $(-5, 6)$.

Sequences and Series

In 17 - 18, write the explicit formula for each sequence.

17. $-3, -6, -12, -24, -48, \dots$

18. $-4, -14, -24, -34, -44, \dots$

19. Find “ n ” if you know that $S_n = 59,046$ in the series $6 + 18 + 54 + 162 \dots$

20. Evaluate $\sum_{n=0}^5 (20 - n^2)$

21. Evaluate $\binom{12}{3}$

In 22 - 23, find each term described.

22. 2nd term in expansion of $(x + 3)^3$

23. 4th term in expansion of $(3u - 1)^4$

In 24 - 25 expand completely.

24. $(2y - x)^4$

25. $(2y + 3x)^3$