

**HONORS PRECALCULUS PREREQUISITE SKILLS TEST**

Name \_\_\_\_\_

**NO Calculator!!! Recommended Time: 1 – 1.5 hours!**

Date \_\_\_\_\_

1. Solve the inequality:  $-3 \leq \frac{2x-5}{3} < 5$

1. \_\_\_\_\_

2. Solve for x:  $\frac{5}{x-1} - \frac{2x}{x+1} = 1$

2. \_\_\_\_\_

3. Find the domain of x in the expression:  $\sqrt{7x+12}$

3. \_\_\_\_\_

4.  $f(x) = 5x - x^2$ , find  $\frac{f(5+h) - f(5)}{h}$

4. \_\_\_\_\_

5. Perform the operation and write the result in standard form:

$$\frac{i}{3-2i} + \frac{2i}{3+8i}$$

5. \_\_\_\_\_

6. Find all solutions of the equation:  $|x^2 - 3| = 2x$

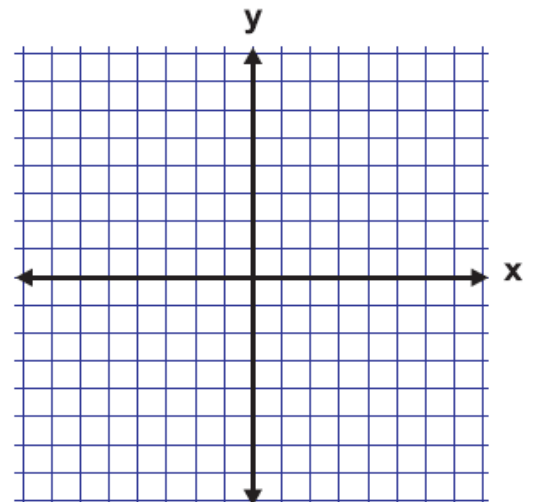
6. \_\_\_\_\_

7. Find all solutions of the equation:  $x^4 - 5x^2 + 6 = 0$

7. \_\_\_\_\_

8. You have 100 feet of fencing to use for three sides of a rectangular fence, with your house enclosing the fourth side. The area of the enclosure is given by  $A = -2x^2 + 100x$ . Graph the equation to find the maximum area possible, and how long each side needs to be to obtain that area.

8. \_\_\_\_\_

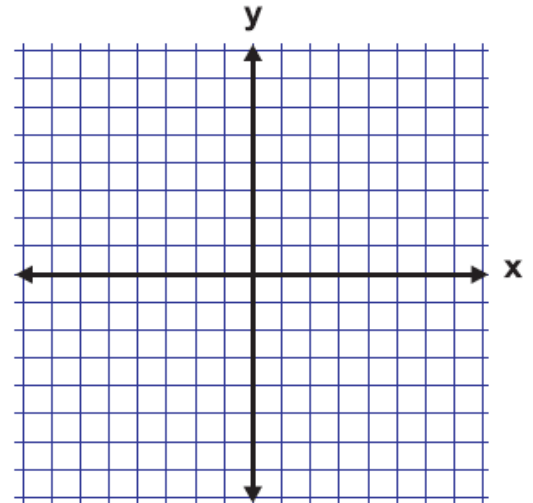


9. Write equations of the lines through (3, -2) (a) parallel and (b) perpendicular to  $5x - 4y = 8$ .

9a. \_\_\_\_\_

9b. \_\_\_\_\_

10. Graph the function:  $g(t) = 3\cos(t + \pi)$



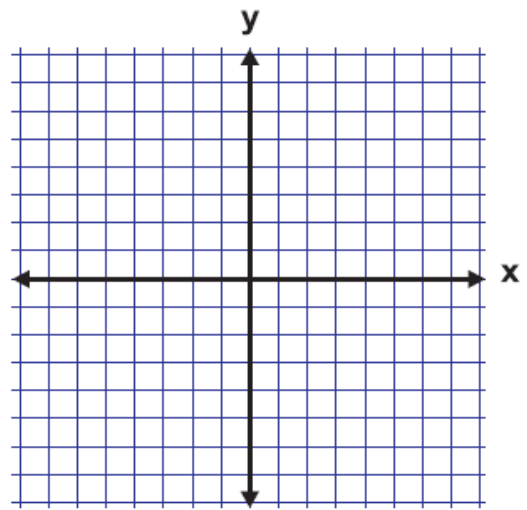
11. Use long division to divide:  $\frac{x^4 + 3x^2 + 1}{x^2 - 2x + 3}$

11. \_\_\_\_\_

12. Solve for x:  $x^3 - 12x^2 + 40x - 24 = 0$

12. \_\_\_\_\_

13. Sketch the graph of the function by finding vertical and horizontal asymptotes, x- and y-intercepts, domain and range, and symmetry:  $f(x) = \frac{x+4}{x^2+x-6}$ .



14. Find the exponential function  $y = ae^{bx}$  that passes through (0, 2) and (4, 3). Exact answer is required.

14. \_\_\_\_\_

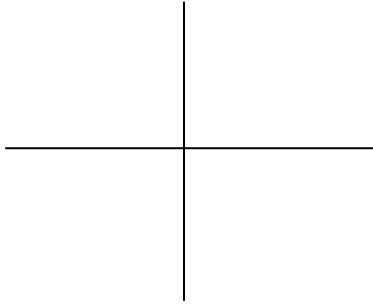
15. Solve for x:  $3^{1-x} = 5^x$ . Exact answer is required.

15. \_\_\_\_\_

16. The angle of depression from the top of a building to the base of a statue 40 feet from the base of the building is  $60^\circ$ . Determine the height of the building.

16. \_\_\_\_\_

17. You are given a point  $(-8, 6)$  on the terminal side of an angle  $\theta$ . Sketch the angle and find its six trigonometric functions.



17.  $\sin \theta =$  \_\_\_\_\_  
 $\cos \theta =$  \_\_\_\_\_  
 $\tan \theta =$  \_\_\_\_\_  
 $\csc \theta =$  \_\_\_\_\_  
 $\sec \theta =$  \_\_\_\_\_  
 $\cot \theta =$  \_\_\_\_\_

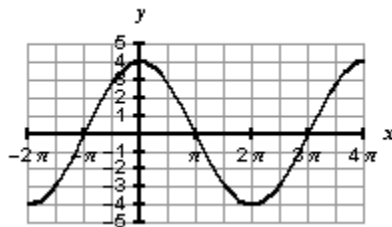
18. Find all solutions of  $2 \sin 2x - \sqrt{2} = 0$  in the interval  $[0, 2\pi)$ .

18. \_\_\_\_\_

19. Use inverse functions where needed to find all solutions of  $\tan^2 x + \tan x - 12 = 0$  in the interval  $[0, 2\pi)$ . Exact answers are required.

19. \_\_\_\_\_

20. Write an equation for the graph.



20. \_\_\_\_\_

21. Find  $\arcsin\left[\sin\left(\frac{2\pi}{3}\right)\right]$ . 21. \_\_\_\_\_
22. Write the equation of the conic in standard form:  
 $-16x^2 + 36y^2 + 96x - 144y - 16 = 0$  22. \_\_\_\_\_
23. Find the points of intersection:  
 $x^2 + y^2 - 18x + 24y + 200 = 0$  and  $4x + 3y = 0$  23. \_\_\_\_\_
24. Condense the expression:  $3\ln 5 - (\ln 15 - \ln 3)$  24. \_\_\_\_\_
25. Evaluate the expression:  $\log_3 \frac{1}{9}$  25. \_\_\_\_\_