

WENATCHEE VALLEY COLLEGE
Mathematics Placement Quick Exam for Calculus or for Trigonometry

If you have placed yourself in Math 121 Pre-calculus: Trigonometry or Math 124 Calculus and Analytic Geometry I, please complete the following Quick Exam to confirm the accuracy of that placement. The Mathematics department at Wenatchee Valley College strongly recommends that you honestly work through these problems without the aid of a calculator or computer.

The following exam contains 25 questions pertaining to Pre-Calculus skills. The first 21 are pre-trigonometry skills. If you correctly answer 15 or more of the first 21 questions, it is appropriate for you to register for Math 121 Pre-Calculus: Trigonometry. If you correctly answer 15 or more of the first 21 and the last four questions, it is appropriate for you to register for Math 124 Calculus and Analytic Geometry I. Such a score does not guarantee your success in this course, but it does indicate that you possess the appropriate skills to begin mathematics coursework at this level.

A score below 15 indicates that a choice of Math 105 College Algebra or Math 120 Pre-Calculus: Algebra will be more appropriate for your skill level at this point. **Even if you have studied Trigonometry or Calculus in high school a score of below 15 is not unusual.** It is the STRONG opinion of the Mathematics Department that your academic career, especially in mathematics, will be better served by reviewing Algebra prior to commencing study of Trigonometry and/or Calculus.

**Wenatchee Valley College Mathematics Placement Exam for Trigonometry and for
Calculus and Analytic Geometry I**

1. Solve for x : $3x + 7 = 12$.
2. Solve for x : $3(x-3) + 4 = 7(x+1)$.
3. Find an equation of the line passing through the points (3,4) and (6,2).
4. Find an equation of the circle which has center at (7, -1) and has radius 4.
5. Solve for x : $x^2 - 6x - 7 = 0$.
6. Solve for x : $x^2 + x - 1 = 0$.
7. Solve for x : $x(x+1) = 3(x+1)$.
8. Solve for x : $\frac{3}{x+1} = \frac{4}{x+2}$
9. Solve for x : $\sqrt{x} + 7 = 12$
10. Find all x satisfying the inequality: $3x + 7 \leq 5x + 1$
11. Find all x satisfying the inequality $x^2 - 5 \leq 4x$.
12. Find all x satisfying the inequality $\frac{x^2 - 4}{x + 1} < 0$.
13. If $f(x) = x^2 + 1$ and $g(x) = 3x + 1$, find and simplify $f(g(x))$.
14. If $f(x) = x^2 - 3x$, find and simplify $f(6+h)$.
15. If $f(x) = 2x^2 + 1$, find and simplify $\frac{f(x+h) - f(x)}{h}$.
16. What is the domain of the function $f(x) = \frac{x}{(x-3)(x+4)}$?

17. Find all x -intercepts and y -intercepts on the graph of $f(x) = \frac{(x+3)(x-1)}{(x+2)(x-3)}$.
18. If $\log x = 3$ and $\log y = 5$, what is the value of $\log(xy^2)$?
19. Express the solution to $3^x - 4 = 9$ in terms of logarithms.
20. Factor the polynomial $x^3 - 3x^2 - 10x$ into linear factors.
21. Find the coordinates for the vertex of the parabola $y^2 - 4y + 4 = 3x$.
22. Sketch a graph of the function $f(x) = 3 \sin(2x)$ for $0 \leq x \leq 2\pi$.
23. Find all x between 0 and 2π for which $2 + 4\cos x = 0$.
24. Suppose that $\sin \theta = 0.3$ and that θ is an angle in the second quadrant. What is the values of $\cos \theta$?
25. If θ is an angle for which $\sin \theta = \frac{1}{3}$ and $\cos \theta = \frac{2\sqrt{2}}{3}$, what is the value of $\sin(\theta + \pi)$?

Solutions to Mathematics Placement Exam for Trigonometry and Calculus I

1. $\frac{5}{3}$

2. $x = -3$

3. $y = -\frac{2}{3}x + 6$

4. $(x-7)^2 + (y+1)^2 = 16$

5. $x = 7, x = -1$

$x = \frac{-1 + \sqrt{5}}{2}, x = \frac{-1 - \sqrt{5}}{2}$

7. $x = 3, x = -1$

8. $x = 2$

9. $x = 25$

10. $x \geq 3$

11. $-1 \leq x \leq 5$

12. $x < -2$ or $-1 < x < 2$

13. $9x^2 + 6x + 2$

14. $h^2 + 9h + 18$

15. $4x + 2h$

16. $\{x \mid x \neq 3, x \neq -4\}$

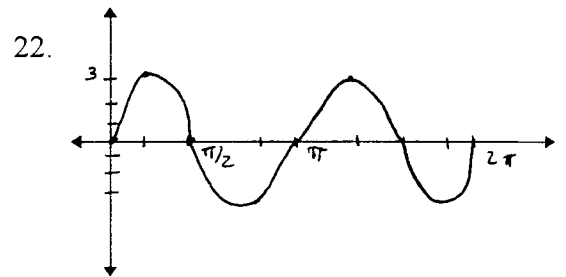
17. $x = -3, x = 1, y = \frac{1}{2}$

18. 13

19. $x = \log_3 13 = \frac{\log 13}{\log 3} = \frac{\ln 13}{\ln 3}$

20. $x(x-5)(x+2)$

21. (0,2)



23. $x = \frac{2\pi}{3}, x = \frac{4\pi}{3}$

24. $x = -\sqrt{91} = -\frac{\sqrt{91}}{10}$

25. $-\frac{1}{3}$