

Course: Calculus

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To be successful in calculus students must have knowledge of the mathematics that precedes calculus and be very comfortable with: algebra, analytic geometry, functions, and trigonometry. This placement will assess your skills in each area.

Placement Exam Instructions

Scholé Academy administers placement exams in order to get to know each student and find the best learning environment for him or her, as we seek to educate our students well and wisely. Students should print and complete this placement exam to confirm proper placement in one of our online math courses. Complete all the problems without using a calculator and without consulting any outside resources. Show ALL of your work neatly on a separate piece of paper, and make sure that each answer is clearly labeled and legible. This exam is a tool used to help our instructors get to know their students—perfection is not expected! If you have any questions about the exam content, you are welcome to reach out to the course instructor via email. The completed placement test should be scanned (no photographs, please!) and emailed to the course instructor, who will respond with placement confirmation. Please note that registration is not finalized until the student has submitted a placement exam and received confirmation of proper placement from the course instructor.

Calculus Placement Test

ALGEBRA

Evaluate each expression.

1. $(-3)^4$
2. $16^{-3/4}$
3. $\frac{5}{3} \times \frac{18}{15}$
4. $5 \cdot 6 - (8 + 2) \div 2$

Simplify each expression. Write your answers without negative exponents.

5. $\sqrt{16a^5b^2}$
6. $(2x - 8)(x + 3)$
7. $(2n^2)^5$
8. $\left(\frac{3x^{\frac{3}{2}}y^3}{x^2y^{\left(-\frac{1}{2}\right)}}\right)^{-2}$

Expand and simplify.

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

10. $3(x + 6) + 4(2x - 5)$

11. $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b})$

Factor each expression.

12. $y^2xz^3 + yx^2z$

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

Simplify the rational expression.

14. $\frac{x^2+3x+2}{x^2-x-2}$

Rationalize the expression and simplify.

15. $\frac{\sqrt{4+h}-2}{h}$

Solve for x.

16. $|-2x + 5| = 7$

17. $\frac{3}{x-2} + \frac{2}{x+2} = \frac{5}{x^2-2}$

18. If Sam can paint their living room in 4 hours, and Suzie can paint the same living room in 5 hours, then how long will it take them to paint the living room working together?

19. Compute $\log_2 32$

ANALYTICAL GEOMETRY

20. Find an equation for the line that passes through the point (2, - 5) and

a. has slope - 3

b. is parallel to the x -axis

c. is parallel to the y -axis

d. is parallel to the line $2x - 4y = 3$

21. Find the area of the region bordered by the lines $4x+7y=14$, $x=1$, and $y=-2$.

22. Sketch the graph of the equation $x^2 + y^2 + 2x + 4y = 11$

FUNCTIONS

23. How are graphs of the functions obtained from the graph of f ?

e. $y = -f(x)$

f. $y = 2f(x) - 1$

g. $y = f(x - 3) + 2$

24. Make a rough sketch of the graph.

h. $y = x^3$

- i. $y = (x + 1)^3$
- j. $y = (x - 2)^3 + 3$
- k. $y = 4 - x^2$
- l. \sqrt{x}
- m. $2\sqrt{x}$
- n. $y = -2^x$
- o. $y = 1 + x^{-1}$

TRIGONOMETRY

25. Given the angle through the point (2, 6), find and simplify the values of the listed trigonometric functions:

- p. $\sin(\theta) = \underline{\hspace{2cm}}$
- q. $\cot(\theta) = \underline{\hspace{2cm}}$
- r. $\sec(\theta) = \underline{\hspace{2cm}}$
- s. $\csc(\theta) = \underline{\hspace{2cm}}$