

placement test

FOR STUDENTS NEW TO THE SAXON PROGRAM upper grades math

Saxon's Upper Grades Placement Test

This placement guide is designed to place students in the appropriate level of the Saxon secondary mathematics series. This placement guide should not be used as the sole basis for deciding what textbook a student should use. Ideally, the exam will be used in conjunction with other information, including the student's record of achievement in prior mathematics courses.

To complete this test, a student will require only scratch paper and a pencil. Calculator use is strongly discouraged. Graph paper may be used but is not required. This is a four-part test.

Part I determines students' readiness for Saxon's *Algebra 1* textbook.

Part II determines students' readiness for Saxon's *Algebra 2* textbook.

Part III determines students' readiness for Saxon's *Advanced Mathematics* textbook.

Part IV determines students' readiness for Saxon's *Calculus* textbook.

For Parts I–III, solving 8, 9, or 10 problems correctly indicates readiness for the specified textbook. Students who solve 5, 6, or 7 problems correctly may also be ready for the specified textbook, but further assessment of the student's knowledge and skills is needed. Performance in prior mathematics courses would be a most helpful indicator in this situation. Solving fewer than five questions correctly indicates the student is not ready for the specified textbook. If a student answers fewer than five questions correctly in Part I, consider using Saxon's *Algebra $\frac{1}{2}$* or *Math 87*.

For Part IV, solving 10, 11, or 12 problems correctly indicates readiness for Saxon's *Calculus*. A student who solves 7, 8, or 9 problems correctly may also be ready for *Calculus*, but only if that student has performed well in Saxon's *Advanced Mathematics* or some other pre-calculus course.

To get a full picture of the student's knowledge and ability, a student taking this test should complete as many of the parts as possible and stop when he or she cannot answer any more problems. For example, even if the student believes he or she belongs in the Saxon's *Calculus* textbook, he or she should begin working the test from Part I. This way, the student will be able to pinpoint difficult areas.

Students who have not taken an algebra course will likely be able to solve only through Part I. Students who have completed a first year algebra course will likely be able to complete through Part II. Students who have completed two years of algebra should be able to complete through Part III. Finally, students who have completed geometry and trigonometry in addition to two years of algebra should be able to complete through Part IV.

Please note that in the Saxon secondary series, what is traditionally covered in four years of high school mathematics (that is, two years of algebra, one year of geometry, and one year of trigonometry and pre-calculus) is covered in just three textbooks, *Algebra 1*, *Algebra 2*, and *Advanced Mathematics*. There is no separate Saxon textbook on geometry. The study of geometry is fully integrated into the three books. This is a more efficient and effective way of teaching mathematics, which is why we cover the same amount of material in fewer textbooks and in less time. It should be noted that the Saxon *Advanced Mathematics* textbook usually is completed in three semesters; however, accelerated students can complete *Advanced Mathematics* in two semesters, and students with weaker preparation may take up to four semesters to cover the textbook.

Call us at **(800) 284-7019** to request copies of the middle grades placement tests. We can also be contacted at **2600 John Saxon Blvd., Norman, OK 73071**; or by e-mail at **info@saxonhomeschool.com**. If you have Internet access please visit our web site at **<http://www.saxonhomeschool.com>**.

Part IV: Readiness Test for Saxon's *Calculus*

The purpose of this section is to determine readiness for Saxon's *Calculus* textbook. Answering 10 or more problems correctly indicates readiness for Saxon's *Calculus* textbook. Answering 7 to 10 questions correctly indicates possible readiness for *Calculus*.

1. Given $f(x) = x^2$, find $f(x + h)$.
2. What are the exact values of (a) $\sin \frac{\pi}{6}$ and (b) $\cos \frac{\pi}{6}$?

3. Simplify:

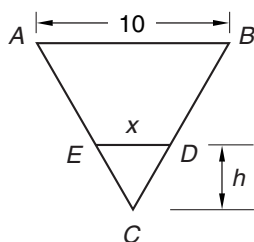
$$\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

4. Graph the function

$$y = \sin\left(x - \frac{\pi}{4}\right)$$

5. Graph the set $\{x \in \mathbb{R} : |x - 3| < 4\}$ on a number line. Note that \mathbb{R} denotes the set of real numbers.
6. Graph the circle whose equation is given by $x^2 + y^2 + 6x - 6y + 2 = 0$. Indicate the coordinates of the center of the circle and the length of the radius of the circle.
7. Solve for x : $\log(1 + x) + \log(2 + x) = 2$

8. Triangle ABC is an equilateral triangle and segment ED is parallel to segment AB as shown in the figure below. Express x in terms of h .



9. Find all pairs (x, y) that simultaneously satisfy the following two equations:

$$x^2 + y^2 = 9$$

$$y - x = 1$$

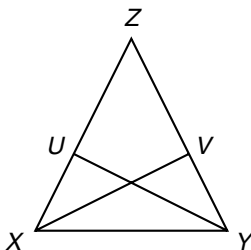
Graph the two equations, and show the points of intersection of the graphs.

10. Prove the following trigonometric identity:

$$\frac{\cos^3(x) + \sin^3(x)}{\cos(x) + \sin(x)} = 1 - \sin(x) \cos(x)$$

11. Write an algebraic equation that expresses the following statement: the sum of the distance between point (x, y) and point $(1, 2)$ and the distance between point (x, y) and point $(3, 4)$ is equal to 10.

12. Given: $\overline{XZ} \cong \overline{YZ}$, $\overline{XV} \perp \overline{YZ}$, $\overline{YU} \perp \overline{XZ}$. Write a two-column proof to show that $\overline{XV} \cong \overline{YU}$.

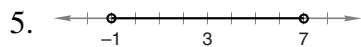
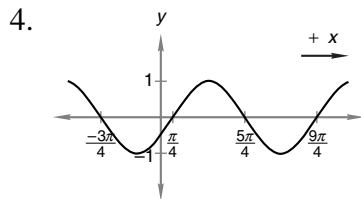


PART IV

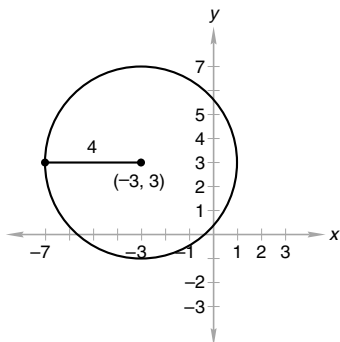
1. $x^2 + 2xh + h^2$

2. $\frac{1}{2}; \frac{\sqrt{3}}{2}$

3. $\frac{-1}{x(x+h)}$

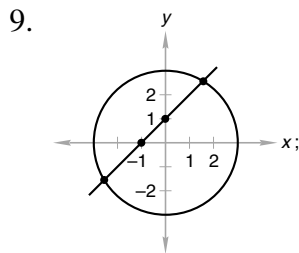


6. radius = 4; center = (-3, 3);



7. $x = \frac{-3}{2} + \frac{\sqrt{401}}{2}$

8. $x = \frac{2\sqrt{3}}{3}h$



$$\left(\frac{-1}{2} + \frac{\sqrt{17}}{2}, \frac{1}{2} + \frac{\sqrt{17}}{2} \right),$$

$$\left(\frac{-1}{2} - \frac{\sqrt{17}}{2}, \frac{-1}{2} - \frac{\sqrt{17}}{2} \right)$$

10.
$$\frac{\cos^3 x + \sin^3 x}{\cos x + \sin x}$$

$$= \frac{(\cos x + \sin x)(\cos^2 x - \cos x \sin x + \sin^2 x)}{\cos x + \sin x}$$

$$= \cos^2 x - \cos x \sin x + \sin^2 x$$

$$= 1 - \sin x \cos x$$

11.
$$\sqrt{(x-1)^2 + (y-2)^2}$$

$$+ \sqrt{(x-3)^2 + (y-4)^2} = 10$$

12.

STATEMENTS	REASONS
1. $\overline{XZ} \cong \overline{YZ}$	1. Given
2. $\triangle XYZ$ is isosceles	2. Definition of isosceles triangle
3. $\angle ZXY \cong \angle ZYX$	3. Base angles of an isosceles triangle are congruent.
4. $\angle XUY$ is a right angle; $\angle YVX$ is a right angle	4. Given
5. $\angle XUY \cong \angle YVX$	5. Right angles are congruent.
6. $\angle UYX \cong \angle VXY$	6. AA \rightarrow AAA
7. $\overline{XY} \cong \overline{XY}$	7. Reflexive axiom
8. $\triangle XUY \cong \triangle YVX$	8. AAAS congruency postulate
9. $\overline{XV} \cong \overline{YU}$	9. CPCTC