

P.E.R.T. Math Study Guide

Introduction

The purpose of Florida's Postsecondary Education Readiness Test (P.E.R.T.) is to adequately assess your academic skills in mathematics, reading and writing through the delivery of three assessments, one for each of these areas. The results of these assessments are used to determine your placement into appropriate courses at your college. If you are placed in a developmental course(s), then you have the opportunity to take the P.E.R.T. to determine if you are able to enroll in college level English and/or mathematics and forego the developmental course(s).

You cannot pass or fail the P.E.R.T. It is only used to determine which courses are best for you. While it doesn't impact your grades, take the P.E.R.T. seriously so that your course placement is accurate. Refer to the table below for the range of scores for placement purposes.

How the P.E.R.T. Works

The P.E.R.T. assessments are computer-adaptive, which means the questions are chosen based on your answers to previous questions. You will not be permitted to change your answers once you have moved on to the next question or leave a question unanswered. However, all of the P.E.R.T. assessments are untimed, so you have as much time as you need to consider each question before submitting your answer. If you do not know the answer to a specific question, you should attempt to eliminate one or more of the choices and then select the best answer from the remaining choices.

You will not be allowed to bring a calculator with you; however, for certain questions, a pop-up calculator will be available for your use. Check with your testing center for what to bring or not to bring with you on test day. Scores, on each assessment, will be available immediately.

The math portion is 30 questions: 25 are operational items which form the basis for your placement score plus 5 field test items to continuously enhance the operational test bank. The scaled scores range from 50 to 150.

Pensacola State College Placement Score *Guide for Mathematics

P.E.R.T. Math Score Range	Math Course Placement
from 50 to 95	MAT 0018 (Developmental Math I)
from 96 to 113	MAT 0028 (Developmental Math II)
from 112 to 113	**MAT 055 (Developmental Math Modules) **by permission only
from 109 to 111	**MAT 056 (Developmental Math Modules) **by permission only
from 114 to 122	MAT 1033C (Intermediate Algebra)
from 123 to 150	MAT 1105 (College Algebra) or STA 2023 (Elementary Statistics)
from 114 to 150	MAT 1106 (Liberal Arts Math I) or MAT 1107 (Liberal Arts Math II)

*This guide presents recommended placement for students exempted from common placement testing and developmental education per Rule 6A-10.0315, Florida Administration Code. This guide presents required placement for non-exempt students. Please see your guidance counselor for more information concerning testing and appropriate course selection/placement.

P.E.R.T. Math Study Guide

Test Taking/Preparation Tips

- Refer to a comprehensive math review at the website below.
<https://valenciacollege.edu/students/assessments/documents/PERTmathbookletUPDATE.pdf>
- Take practice assessments and visit one of the Math Labs for assistance.
- Read and follow the directions carefully.
- Apply reasoning skills to answer each question.
- Be sure to review each answer carefully before submitting.

P.E.R.T. Math Competency Descriptions (Florida Department of Education)

The following is a sample of the type of information you will need to perform well on the math portion of the P.E.R.T. It is not intended to be a comprehensive listing of all content to be tested.

The tutors in the Math Lab are available for assistance, but only for currently enrolled PSC students.

Neither the math lab nor this study guide is a substitute for a math book, a math teacher, or a comprehensive preparatory course.

- Be able to define and give examples of natural numbers, whole numbers, integers, rational numbers, irrational numbers, and real numbers.
- Explain and apply basic number theory concepts such as prime number, factor, divisibility, least common multiple, and greatest common divisor.
- Evaluate numeric and algebraic expressions, including those with parentheses and exponents, by applying the correct order of operations.
- Add, subtract, multiply and divide with integers, rational numbers (fractions, decimals) and irrational numbers (square roots).
- Solve multi-step problems involving fractions and percentages. Include situations such as simple interest, tax, markups/markdowns, gratuities and commissions, fees, percent increase or decrease, percent error, expressing rent as a percentage of take-home pay, etc.
- Locate the position of a number on the number line. Know that its distance from the origin is its absolute value. Know that the distance between two numbers on the number line is the absolute value of their difference.
- Simplify sums and differences of absolute values.
- Use mathematical strategies to formulate a problem in mathematical terms, reach a solution, and interpret the solution in the context of the original problem
- Use estimation and approximation to solve problems. Include evaluating answers for their reasonableness, detecting errors, and giving answers to an appropriate level of precision
- Use calculators appropriately and make estimations without a calculator to detect potential errors.
- In word problems, distinguish relevant from irrelevant information, identify missing information, and either find the exact solution or an approximate solution.
- Calculate and apply ratios, proportions, rates and percentages to solve problems.

P.E.R.T. Math Study Guide

- Solve word problems that involve a direct variation or an inverse variation.
- Use and interpret quantities and units correctly in algebraic formulas. Include specifying units when defining variables and attending to units when writing expressions and equations.
- Use the symbols of mathematics correctly and precisely. Include function notation. Include interpreting parts of an expression, such as terms, factor, coefficient, base, and exponent.
- Define variables and write an expression to represent a quantity in a word problem
- Translate and solve mathematical word problems. Include area and perimeter problems.
- Recognize and solve problems that can be modeled using a linear equation in one variable, such as time/rate/distance problems, percent change problems, and ratio and proportion problems.
- Use scientific notation to express very large numbers or very small numbers.
- Determine the relative position on the number line of numbers and the relative magnitude of numbers expressed in fractional form, in decimal form, as roots or in scientific notation.
- Compare numbers and make sense of their magnitude. Include positive and negative numbers expressed as fractions, decimals, powers, square roots and cube roots.
- Add, subtract, multiply, and divide polynomials. Divide by monomials and binomials.
- Simplify radical expressions. Add, subtract, or multiply square roots of monomials.
- Convert and simplify expressions involving percentages, fractions and decimals.
- Apply properties of exponents to evaluate and simplify algebraic expressions.
- Solve linear equations, linear inequalities (graph solutions on a number line), and literal equations using the addition and multiplication property of equations.
- Factor polynomial expressions using the greatest common factor, grouping terms, and recognizing a difference of two squares.
- Solve a quadratic equation in one variable by factoring.
- Add, subtract, multiply, divide, and simplify rational expressions.
- Compute the slope of a line given two ordered pairs on the line. Distinguish between lines that have positive slope, negative slope, zero slope and undefined slope.
- Given a linear equation in one or two variables, create its graph in the coordinate plane. Include slanted lines, horizontal lines and vertical lines. Include function notation.
- Write equations of lines in standard form, slope-intercept form and point-slope form.
- Solve a system of linear equations in two variables. Include algebraic techniques of substitution and elimination, and graphical techniques. Know how to check solutions by inspection.

P.E.R.T. Math Study Guide

The following are sample exercises and their solutions for the math portion of the P.E.R.T.

1. Apply the order of operations to evaluate the numeric expression: $25 - [4 - 3(2 - 4)^2]$
2. If $m = 3$ and $n = -4$, evaluate the algebraic expression: $-2m^2 + mn - n$
3. Find the difference of the following absolute values: $\left|3\frac{1}{4}\right| - \left|-\frac{1}{3}\right|$
4. Solve the quadratic equation for x : $(2x^2 - 8x) + (3x - 12) = 0$
5. Divide the polynomials and simplify: $\frac{x^2+9x+8}{x^2-3x-4}$
6. If the variable n is an odd integer, give expressions for the next two consecutive odd integers.
7. Solve the rational equation for k : $\frac{k}{3} + \frac{4k}{5} = 1$
8. Simplify by combining the two polynomials: $(6x^2 - 3x - 7) - (3x^2 - 2x + 5)$
9. If the function $f(x) = 4x^2 - x + 3$, evaluate $f(-2)$.
10. Solve for z : $\frac{6}{5}z = \frac{4}{7}$
11. A rectangle is $3\frac{1}{2}$ cm long by $4\frac{3}{4}$ cm wide. What is the perimeter of the rectangle?
12. Compute the sum of two unlike radicals: $\sqrt{7} + \sqrt{63}$.
13. Solve the compound inequality for x : $2 < 3x - 5 < 4$.
14. Solve the linear inequality for t : $1 - 2t \geq -5$
15. Multiply the two binomials and simplify completely: $(a + \frac{3}{4})(a - \frac{3}{4})$
16. Write in scientific notation the number whose word-name is “zero and eighteen thousandths”.
17. Solve the system of linear equations: $\begin{cases} 3x + 5y = 3 \\ x + 4y = 8 \end{cases}$

P.E.R.T. Math Study Guide

18. Simplify the rational expression: $\frac{3x^4y^2}{6xy^3}$
19. Apply the properties of exponents to multiply the two monomials: $(3ab)^2(-5ab^4)$
20. A slanted line contains the points $(-1, -4)$ and $(4, 2)$. What is the slope of this line?
21. Simplify the irrational number expression: $3\sqrt{2p} - 8\sqrt{2p} + 2\sqrt{8p}$
22. The math lab break room is 12 feet long and 24 feet wide and needs new carpet. The big-box store sells commercial-grade carpet in 72 ft.^2 rolls. How many rolls of carpet are needed to replace the carpet in the break room?
23. If 10 is increased to 13, what is the percent increase?
24. Solve the literal equation for W : $P = 2L + 2W$.
25. Your math test scores are 78, 89, 76, 50, 82 and 69. The teacher says your average grade for the course is the mean of the test scores. What is your average grade?
26. The recommended dosage of a certain medicine is 2 mg for every 80 lb. of body weight. How much of this medication is required for a person weighing 220 pounds?
27. Rewrite the equation of a line given by $y = \frac{2}{3}x + 6$ in standard form.
28. The frequency (number of vibrations per second) of a vibrating harp string varies inversely as its length. That is, a longer string vibrates fewer times per second than a shorter string of the same thickness. Suppose a harp string 65 cm long vibrates 4 times per second. What is the frequency for a harp string that is 50 cm long?
29. The father of the bride will give the waiter a 25% tip at the wedding rehearsal dinner party. If the bill is \$418.60, how much (to the nearest dollar) should he tip?
30. An automobile mechanic estimates that the brake pads on a pick-up truck still have 6,000 miles of wear left on them. This is about 12% of the estimated safe-life use of the truck's brake pads. What is the estimated safe-life use of the brake pads?

P.E.R.T. Math Study Guide

Solutions for the sample practice exercises.

1. 33

2. -26

3. $2\frac{11}{12}$

4. $x = 4$, or $x = \frac{-3}{2}$

5. $\frac{x+8}{x-4}$

6. $(n+2), (n+4)$

7. $k = \frac{15}{17}$

8. $3x^2 - x - 12$

9. $f(-2) = 21$

10. $z = \frac{10}{21}$

11. perimeter is $16\frac{1}{2}$ cm

12. $4\sqrt{7}$

13. $\frac{7}{3} < x < 3$

14. $t \leq 3$

15. $a^2 - \frac{9}{16}$

16. $0.018 = 1.8 \times 10^{-2}$

17. $(-4, 3)$ or $x = -4, y = 3$

18. $\frac{x^3}{2y}$

19. $-45a^3b^6$

20. slope: $m = \frac{6}{5}$

21. $-\sqrt{2p}$

22. 4 rolls of carpet

23. 30% increase

24. $W = \frac{P-2L}{2}$ or $W = \frac{P}{2} - L$

25. $\frac{(78+89+76+50+82+69)}{6} = 74$

26. 5.5 mg

27. $2x - 3y = -18$

28. 5.2 vibrations per second

29. \$105 tip

30. 50,000 miles