

Practice Exam 1

Part C contains problems which you have to solve correctly to pass the course with minimal grade C. There is no partial credit for these problems. Part AB contains problems for a grade higher than C.

This Practice Exam contains **more** problems than the actual exam will have. Make sure that you can handle **all** the problems in this practice exam, since on the exam you'll see the same types of problems. Also, practice solving problems in **timely** manner.

On the exam you have to show all your work, that is provide **complete** solution for the problems. Calculators are **not** allowed.

Part C

1. Calculate

a) $\frac{\frac{3}{2} + \frac{2}{3}}{2\left(1 - \frac{3}{7}\right)}$ b) $\frac{2 - \frac{3}{5}}{\frac{8/7}{7/4}}$ c) $3 - 2 \div (1 - 4) + 3 \cdot 2$

2. What is the value of the expression $\frac{x+1}{x^2+1}$ for $x = -2$?

3. Clear parentheses and combine similar terms in the expression $(2x-1)(x-3)$.

4. Use the difference of squares formula to factor the following expressions

a) $1 - x^2$ b) $4x^2 - 1$ c) $64 - x^2$ d) $25a^2 - 9b^2$

5. Factor the following perfect square trinomials

a) $x^2 + 2x + 1$ b) $x^2 - 4x + 4$ c) $4x^2 - 12x + 9$ d) $25x^2 + 10x + 1$

6. Simplify the following expressions

a) $\frac{x^2 - 4x + 4}{x^2 - 4}$ b) $\frac{x^2 - 4}{4x^2 - 8x}$ c) $\frac{x^2 - 100}{10 - x}$

7. Solve the equations and check your solution by substitution into the equation:

a) $5 - 3x = 1$ b) $1 - 2(3x - 1) = 2x$ c) $\frac{2x}{3} + 4 = 2\left(x - \frac{2}{3}\right)$

8. Solve the following equations

a) $2(x+1) = 2x+2$ b) $2(x+1) = 2x-2$ c) $\frac{\pi x}{2} + \sqrt{3} = x - \pi$

9. Solve the equation $|3x - 1| = \frac{4}{5}$ and check your solution by substitution.

10. Solve the inequality $2x + 3 \leq -2(x - 3)$ and give the answer in an interval notation.

11. Solve the problems using an equation: first, introduce a variable, then compose an equation, and finally, solve the equation. Solutions by other methods will give no credit.

- a) A pair of jeans costs \$56 on a 20% sale. What was the regular price of this pair?
- b) Sales tax rate in Suffolk county is 8.625%. Tom spent \$1,303.50 in Stony Brook bookstore. What was the price for his purchase before tax?
- c) Elspark, an electric utility company, charges a base rate of \$20 per month plus a power supply charge of 9 cents per 1 kWh. What was the electricity consumption last month if the month's bill shows \$104.60?
- d) A bathtub contains 40 gallons of water. One starts filling more water at the rate of 8 gallons per minute. How long will it take to fill the bathtub up to 96 gallons?
- e) A rectangle has a perimeter of 30 in. If one side is 7 in longer than the other, what are the lengths of the sides?
- f) In a triangle ABC , the angle A is 20° greater than the angle B and twice less as the angle C . Find the angles of the triangle.

12. Draw the graphs of the following equations:

- a) $-5x + 2y = 4$ b) $x = 3$ c) $y = -\pi$ d) $x = 0$, e) $y = 0$.

Part AB

- Find the value of the expression $\frac{x^2 - 2x + 3}{2x + 1}$ for $x = \frac{1}{2}$.
- Clear parentheses in the expression $x(x(x + 1) - 1) + 1$.
- Solve the following equation and check your solution $\frac{2}{3}(2x - 1) + 1 = \frac{1}{2}x + \frac{1}{3}$.
- Solve the inequalities and give the answer in an interval notation
 - $2(2 - x) \leq x + 5 < 3x - 4$
 - $1 - x \leq 2x + 1 < 4$.
- For the line $-2x + 3y = 6$, find the slope, the x -intercept and the y -intercept. Draw the line on the coordinate system. Show on your picture the x - and y -intercepts.
- Let $C = \frac{5}{9}(F - 32)$. Find F in terms of C (that is, solve for F).
- The Earth's equator is 24,900 miles long. Using this fact, find the radius of the Earth.