

Tompkins Cortland Community College – Mathematics Placement Program

Math 135 (Precalculus) Qualifying Test -

Practice Problems – Page 1

This practice test has been developed for your use to help prepare you to take the college's placement test for Math 135 (Precalculus) and to give you an idea of the skills necessary to be successful in that course. You are expected to have a solid foundation in algebra skills. The questions below are similar to, but not identical to the questions on the placement test. If these questions seem too difficult or too easy for you, reconsider taking Math 135 and speak to an advisor about alternatives. Answers (on separate sheet) should be consulted AFTER completion.

1. A tree is 60 feet tall. Standing some distance from the tree, your line of sight to the top of the tree is 38° above the ground. How far are you standing from the base of the tree, to the nearest foot?

(2–5) Use a right triangle with $C=90^\circ$, hypotenuse $AB=15$, and short side $AC=14$. (Hint: sketch the triangle.) Give *exact answers* to the following questions (no decimal approximations).

2. Find the length of the third side.

4. Find $\tan A$ in fractional form

3. Find $\cos A$ in fractional form

5. Find $\sin A$ in fractional form

6. Give the complement and supplement of the angle $\frac{\pi}{6}$ in degrees.

7. The sine of an angle is positive. Which quadrant(s) might the angle be in?

8. Write the equation in $y=mx+b$ form for the line that passes through points $(3,-2)$ and $(-4, 26)$

9. Subtract and write in simplest form: $\frac{3x}{7} - \frac{5-4x}{2}$

10. Use the conjugate to rationalize the denominator: $\frac{4}{\sqrt{5}+7}$

11. Rewrite in simplest radical form: $\sqrt{x^7 y^5}$

12. Rewrite in exponential form: $\sqrt{a^9}$

(13–14) Simplify using the rules of exponents. Each base must appear only once.

13. $(a^2b^{\frac{3}{5}})^5$

14. $(5p^{\frac{3}{4}}q^3)(3p^{\frac{-3}{4}}q^2)$

(15–16) Expand and write in simplest form:

15. $(2p - 7)^2$

16. $(3a + 2b)(4a - 3b)$

17. Use the distributive property to multiply the expression, then simplify: $x^{\frac{2}{5}}(x^{\frac{8}{5}} + x^{\frac{-2}{5}})$

(18–21) Solve the following equations.

18. $18x^2 + 54x = 0$

19. $\frac{2}{x} - 3 = \frac{1}{4}$

20. $|6x - 7| = 5$

21. $12x^2 + x = 6$