

Pre-Calculus & Trigonometry Readiness Test

This placement test can help you determine if your student is ready for HSLDA Online Academy's [Pre-Calculus and Trigonometry](#) course. If you find that your student needs improvement, we recommend [Algebra 2](#) or [Geometry](#) instead.

All of HSLDA Online Academy's courses have live, weekly class sessions taught by qualified instructors. View our [full list of courses here](#).

Directions:

Separate the answer key from the rest of the pages (the answer key is on the last page). Your student should work independently and without using a calculator. Once the student is finished, grade the test using the answer key. The maximum score is 25 points. If your student correctly answers 20 or more of the following questions, then he/she is likely ready for Pre-Calculus & Trigonometry. The ultimate decision rests with you as the parent.

Special binomial factors:

$$\rightarrow a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$\rightarrow a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

Test

Simplify each expression [1 point each]:

1. $\left(\frac{3x^2}{y}\right)^{-2}$

2. $\sqrt{75x^3}$

3. $2\sqrt{48} - 3\sqrt{27}$

4. $(-32)^{-4/5}$

Factor each expression [1 point each]:

5. $-4x^2 + 12x + 16$

6. $2x(x - 2) + 3(x - 2)$

7. $(x + 2)^2 - y^2$

Perform the following operation, simplify, and state the domain of x [1 point each]:

8. $\frac{x^3-8}{x^2-4} \div \frac{x^2+2x+4}{x^3+8}$

9. $\frac{x}{x-3} - \frac{2}{3x+4}$

Solve the following problems [2 points each]:

10. Solve $2x^2 + 9x + 7 = 3$ by factoring. Then, check your solution using the quadratic formula.

11. Solve $x^2 + 2x - 6 = 0$ by completing the square. Check your solution by substituting back in the original equation.

12. Solve $-3 \leq 6x - 1 < 3$. Graph the solution set on a number line.

13. Solve $|x - 5| < 2$. Graph the solution on a number line.

14. Solve the system of equations for x and y . Graph both equations and show the solution points.

$$\begin{cases} x^2 - y = 1 \\ -x + y = 1 \end{cases}$$

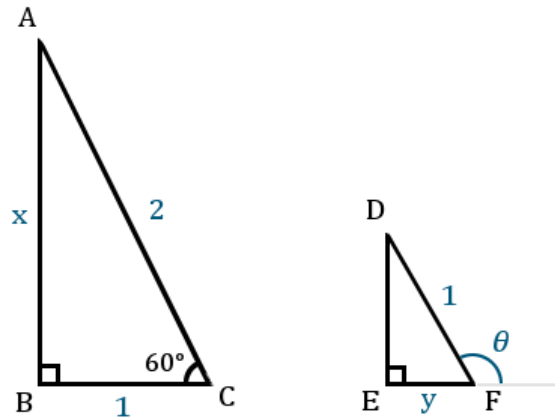
Solve the following problems [1 point each]:

15. Find the equation of the line that passes through point $(1, -2)$ and has a slope of 3.

16. Find the equation of the line that passes through the point $(2, -1)$ and is perpendicular to the line $2x - 3y = 5$.

Problems 17–20 refer to the following figures [1 point each]:

The two right triangles, $\triangle ABC$ and $\triangle DEF$, are similar triangles. Find the following quantities:



17. Find the length of side x

18. Find the length of side y

19. Find angle A

20. Find angle θ

Answer Key

1. $\frac{y^2}{9x^4}$

2. $5x\sqrt{3x}$

3. $-\sqrt{3}$

4. $\frac{1}{16}$

5. $-4(x+1)(x-4)$

6. $(x-2)(2x+3)$

7. $(x+2+y)(x+2-y)$

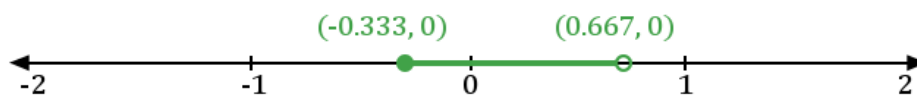
8. $x^2 - 2x + 4, x \neq \pm 2$

9. $\frac{3x^2+2x+6}{(x-3)(3x+4)}, x \neq 3, -\frac{4}{3}$

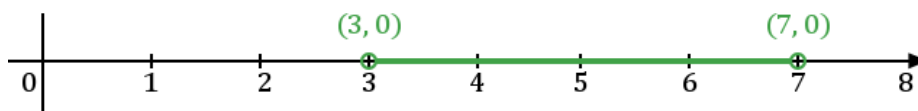
10. $x = -\frac{1}{2}, -4$

11. $x = -1 \pm \sqrt{7}$

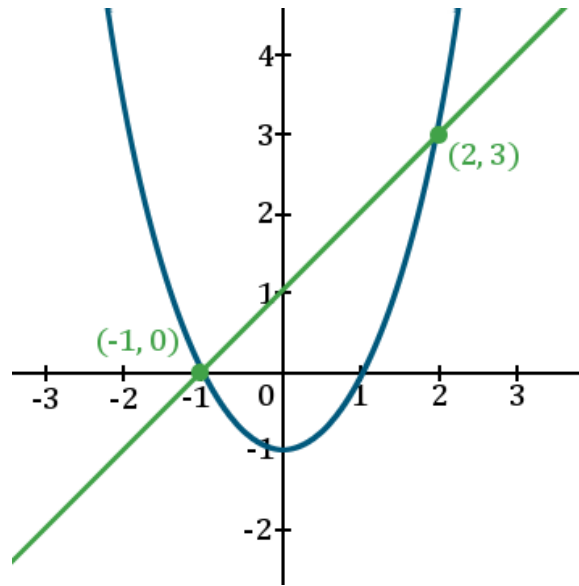
12. $-\frac{1}{3} \leq x < \frac{2}{3}$



13. $3 < x < 7$



14. $(-1, 0), (2, 3)$



15. $y = 3x - 5$

16. $y = -\frac{3}{2}x + 2$

17. $\sqrt{3}$

18. $\frac{1}{2}$

19. 30°

20. 120°