

HSLDA Precalculus and Trigonometry Readiness Test

Test Instructions: Take this test closed-book, closed-notes, and with no assistance. Time and score yourself. The maximum score is 25 points. A score of 20 or above shows readiness. A score below 20 may be of concern. For those with a Saxon curriculum background, a comparable Saxon readiness test is Test III at https://www.sonlight.com/uploads/saxon_upper_placement.pdf for their *Advanced Mathematics* level.

Special binomial factors:

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

4 pts **1. Simplify.**

a. $\left(\frac{3x^2}{y}\right)^{-2}$ b. $\sqrt{75x^3}$ c. $2\sqrt{48} - 3\sqrt{27}$ d. $(-32)^{-4/5}$

3 pts **2. Factor.**

a. $-4x^2 + 12x + 16$ b. $2x(x - 2) + 3(x - 2)$ c. $(x + 2)^2 - y^2$

2 pts **3. Perform the operation, simplify, and state domain of x .**

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

2 pts **4. Solve $2x^2 + 9x + 7 = 3$ by factoring. Then, check your solution using the quadratic formula.**

2 pts **5. Solve $x^2 + 2x - 6 = 0$ by completing the square. Check your solution by substituting back in the original equation.**

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

2 pts **7. Solve $|x - 5| < 2$. Graph the solution set on a number line.**

2 pts **8. Find the equation of the line with the properties.**

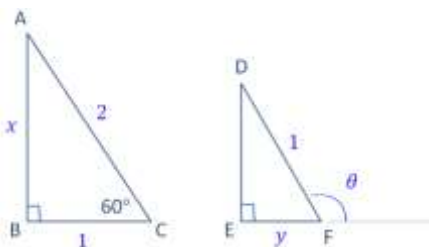
- a. Passes through point $(1, -2)$ and has a slope of 3
- b. Passes through the point $(2, -1)$ and is perpendicular to the line $2x - 3y = 5$

2 pts **9. Solve the system of equations for x and y . Graph both equations and show the solution points.**

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

4 pts **10. Given that the two right triangles, $\triangle ABC$ and $\triangle DEF$, are similar triangles, find the quantities:**

- a. length of side x
- b. length of side y
- c. angle A
- d. angle θ



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Test Answers

4 pts

A.2 E4d
E10c
E11a
E17a

1. a. $\frac{y^2}{9x^4}$ b. $5x\sqrt{3x}$ c. $-\sqrt{3}$ d. $\frac{1}{16}$

3 pts

A.3 E5b*
E5c E7a

2. a. $-4(x+1)(x-4)$ b. $(x-2)(2x+3)$ c. $(x+2+y)(x+2-y)$

2 pts

A.4 E5
E6

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

2 pts

A.5 E4a

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

2 pts

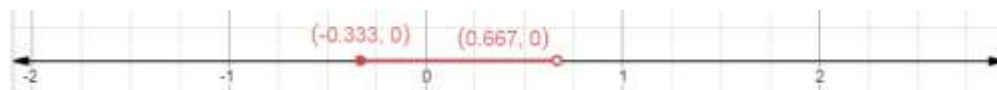
A.5 E6

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

2 pts

A.6 E4

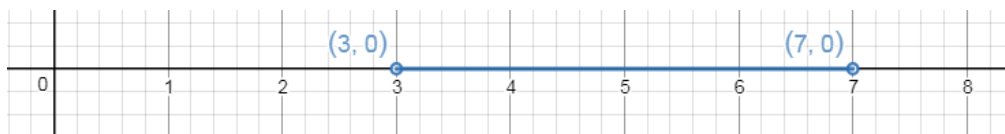
6. $-\frac{1}{3} \leq x < \frac{2}{3}$



2 pts

A.6 E5

7. $3 < x < 7$



2 pts

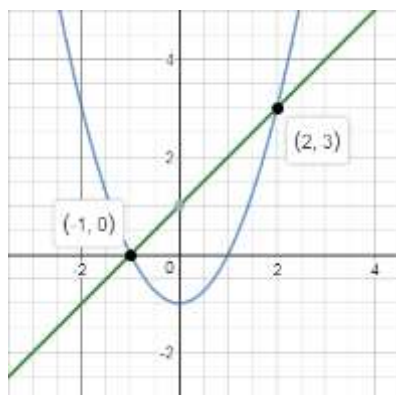
1.3 E3
E4b

8. a. $y = 3x - 5$ b. $y = -\frac{3}{2}x + 2$

2 pts

7.5 E5

9. $(-1, 0), (2, 3)$



4 pts

10. a. $\sqrt{3}$ b. $\frac{1}{2}$ c. 30° d. 120°