HEED Pre-calculus Placement Request

Student's Name: _____

Date of Birth: _____

Parent's E-mail: _____

Parent's telephone: _____

Parents: please read this entire page and follow the directions carefully.

The purpose of this test is to determine your student's readiness for the pre-calculus class at HEED. Your student should complete the test without your direct assistance. If your student is struggling with a problem, he can skip it and go back to it later. It is acceptable for him to review the concept and then return to the question provided that he answers the question on his own. **Parents are required to proctor the test. (The student must be in the same room with the parent while the test is completed.) You MUST sign below indicating you proctored the test.**

Please impress upon your student the importance of carefully reading each question. Also, please remind your student that this test should be an example of **his or her BEST work**. It should be as neat and complete as possible. If your student has any questions regarding the test, please email me at: numb3rs@bellsouth.net.

Please be sure your student follows these directions:

1. Do NOT write on the test.
2. Calculators are NOT permitted for middle school and pre-algebra. Calculators are permitted for algebra 1, geometry, algebra 2 and precalculus. The use of cell phones and computers is strictly forbidden during the test.
3. Do all work NEATLY on a separate piece of paper. It will take several pages to complete the test – it is better to use many pages and be neat and accurate!
4. SHOW all work so I can attempt to discern if incorrect answers are due to computational errors or comprehension issues.
5. Number each problem and circle each answer.

To submit the test:

1. Be sure you completed the student information at the top of this page and signed the proctor statement below.
2. Include this page and ALL work pages in an envelope directed to ~~Kathy Tout~~ Heed Directors
3. Bring the envelope to the HEED office any Monday and give it to one of the mom's in charge or to one of the directors. Alternatively, you can ~~mail it to me, with sufficient postage, to the following address: 18445 Tapadero Terrace, Boca Raton, FL 33496. Please do NOT email it to me.~~ email it to directors@takeheed.org

I will review the placement test as quickly as possible and then email you the results. I will do my best to let you know if your student is already prepared for the HEED pre-calculus class in the fall or if there is some preparation that must be done prior to taking the class.

This test was proctored by the parent whose printed name and signature appear below:

Parent's Printed Name: _____

Parent's Signature: _____

1. Let $A = \{-13, -\frac{12}{4}, 0, \frac{3}{5}, \frac{\pi}{4}, 5.9, \sqrt{49}\}$. List the elements of A that belong to the given set.

   (a) Integers   (b) Rational numbers   (c) Real numbers

2. Evaluate the expression if $x = -2$, $y = -4$, and $z = 5$: $\left|\dfrac{x^2 + 2yz}{3(x + z)}\right|$.

3. Identify each property illustrated. Let a, b, and c represent any real numbers.

   (a) $a + (b + c) = (a + b) + c$ (b) $a + (c + b) = a + (b + c)$

   (c) $a(b + c) = ab + ac$ (d) $a + [b + (-b)] = a + 0$

4. *Passing Rating for an NFL Quarterback*   Use the formula (on Right) to approximate the Passing rating of Matt Hasselbeck of the Seattle Seahawks in 2002. He attempted 419 passes, completed 267, had 3075 total yards, threw for 15 touchdowns, and had 10 interceptions.

Perform the indicated operations.

5. $(x^2 - 3x + 2) - (x - 4x^2) + 3x(2x + 1)$ 6. $(6r - 5)^2$

7. $(t + 2)(3t^2 - t + 4)$ 8. $\dfrac{2x^3 - 11x^2 + 28}{x - 5}$

(Modeling) Adjusted Poverty Threshold   *The adjusted poverty threshold for a single person between the years 1997 and 2003 can be approximated by the polynomial*

$$5.476x^2 + 154.3x + 7889,$$

where $x = 0$ corresponds to 1997, $x = 1$ corresponds to 1998, and so on, and the amount is in dollars. According to this model, what was the adjusted poverty threshold in each given year? (Source: U.S. Department of Health and Human Services.)

9. 2000   10. 2002

Factor completely.

11. $6x^2 - 17x + 7$ 12. $x^4 - 16$

13. $24m^3 - 14m^2 - 24m$ 14. $x^3y^2 - 9x^3 - 8y^2 + 72$

Perform the indicated operations.

15. $\dfrac{5x^2 - 9x - 2}{30x^3 + 6x^2} \cdot \dfrac{2x^8 + 6x^7 + 4x^6}{x^4 - 3x^2 - 4}$

16. $\dfrac{x}{x^2 + 3x + 2} + \dfrac{2x}{2x^2 - x - 3}$

17. $\dfrac{a + b}{2a - 3} - \dfrac{a - b}{3 - 2a}$

18. $\dfrac{y - 2}{y - \dfrac{4}{y}}$

19. Simplify $\left(\dfrac{x^{-2}y^{-1/3}}{x^{-5/3}y^{-2/3}}\right)^3$ so there are no negative exponents. Assume all variables represent positive real numbers.

20. Evaluate $\left(-\dfrac{64}{27}\right)^{-2/3}$.

Simplify. Assume all variables represent positive real numbers.

21. $\sqrt{18x^5y^8}$ 22. $\sqrt{32x} + \sqrt{2x} - \sqrt{18x}$

23. $(\sqrt{x} - \sqrt{y})(\sqrt{x} + \sqrt{y})$

24. Rationalize the denominator of $\dfrac{14}{\sqrt{11} - \sqrt{7}}$ and simplify.

25. *(Modeling) Period of a Pendulum*   The period t in seconds of the swing of a pendulum is given by the equation

$$t = 2\pi\sqrt{\dfrac{L}{32}},$$

where L is the length of the pendulum in feet. Find the period of a pendulum 3.5 ft long. Use a calculator.

Passing Rating $\approx 85.68\left(\frac{C}{A}\right) + 4.31\left(\frac{Y}{A}\right) + 326.42\left(\frac{T}{A}\right) - 419.07\left(\frac{I}{A}\right)$,

where A = number of passes attempted, C = number of passes completed, Y = total number of yards gained passing, T = number of touchdown passes, and I = number of interceptions.