OU Math Day 2014

Algebra 1 Test

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1. Solve the equation $7x + 3(4x - 5) = 0$ for x.

   (A) 1/5 (B) 5/19 (C) 15/19 (D) 5/11 (E) None of the above

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2. What is the value of 2^{3^2}?

   (A) 512 (B) 256 (C) 128 (D) 64 (E) None of the above

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3. Which of the following is **NOT** equal to $\frac{1}{6} + \frac{3}{4}$?

   (A) $\frac{4}{6} + \frac{1}{4}$ (B) $\frac{19}{60} + \frac{3}{5}$ (C) $\frac{5}{6} + \frac{1}{8}$ (D) $1 - \frac{1}{12}$ (E) $\frac{1}{2} + \frac{5}{12}$

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4. Find the simplest radical form of $\sqrt{14}\sqrt{28}\sqrt{10}/7$

   (A) $4\sqrt{5}$ (B) $2\sqrt{10}$ (C) $\sqrt{10}$ (D) $4\sqrt{10}$ (E) None of the above

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5. What day of the week will it be 100 days from today?

   (A) Friday (B) Sunday (C) Wednesday (D) Saturday (E) None of the above

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6. The reciprocal of $\frac{1}{4}+\frac{1}{5}+\frac{1}{6}$ is

(A) 5 (B) 15 (C) 60/37 (D) 60/47 (E) None of the above

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7. All of the solutions to the equation $\sqrt{y^2}=9$ are

(A) $y=\pm 9$ (B) $y=81$ (C) $y=\pm 3$ (D) $y=3$ (E) None of the above

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8. Jan's grandfather is celebrating his birthday today and his year of birth was the last year that was a perfect square. How old is he today?

(A) 64 (B) 77 (C) 78 (D) 81 (E) None of the above

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9. Which of the five listed numbers is smallest?

(A) $\frac{7}{1/5}$ (B) $\frac{1/5}{7}$ (C) $\frac{7}{5}$ (D) $\frac{5}{1/7}$ (E) $\frac{1/5}{1/7}$

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10. $6^6+6^6+6^6+6^6+6^6+6^6$ equals?

(A) 6^6 (B) 36^6 (C) 6^{36} (D) 36^{36} (E) 6^7

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11. Evaluate $\frac{c^4d^4e^5}{c^{-1}(d^{-2}e^5)^{-3}}$

(A) $c^3d^{-2}e^{20}$ (B) $c^5d^{-2}e^{20}$ (C) $c^5d^2e^{-15}$ (D) $c^3d^{10}e^{-10}$ (E) None of the above

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12. If B is 20% larger than A and A is 60% larger than C then how much larger than C is B?

(A) 92% (B) 120% (C) 40% (D) 80% (E) None of the above

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13. Amy and Fred left the train station at 9:00 am walking in opposite directions. At 1:00 pm that same day they were 20 miles apart. If Fred walks 0.5 mph slower than Amy then what is Amy's walking speed?

(A) 2.25 mph (B) 2.75 mph (C) 3.5 mph (D) 5 mph (E) None of the above

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14. If $6x^2 - 11x - 10 = (3x + 2)(Ax + B)$ then the value of $A + B$ is

(A) -3 (B) 5 (C) -5 (D) 3 (E) None of the above

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15. Wendy's mother is three times older than Wendy, and in twelve years she will be twice as old as Wendy is then. How old is Wendy now?

(A) 4 (B) 8 (C) 12 (D) 16 (E) None of the above

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16. All of the solutions to the equation $3 = \dfrac{4 + w}{w - 1}$ are

(A) $w = 7/2$ (B) $w = 5/2$ (C) $w = 1/2$ (D) $w = -7/2$ (E) None of the above

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17. The expression $\dfrac{x+3}{2}+\dfrac{2}{x/5}+\dfrac{1}{1/x}-5\dfrac{1}{x/2}-\dfrac{4x+12}{8}$ simplifies to

(A) $x+3$ (B) $1/x$ (C) $x+\dfrac{20}{x}$ (D) x (E) None of the above

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18. Two high school classes took the same test. One class of 20 students made an average of 80%; the other class of 30 students made an average of 70%. The average grade for all students in both classes is

(A) 75% (B) 74% (C) 72% (D) 77% (E) None of the above

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19. If numbers x and y satisfy $x-y=xy$ then $\dfrac{1}{x}-\dfrac{1}{y}$ equals

(A) $\dfrac{1}{xy}$ (B) $\dfrac{1}{x-y}$ (C) -1 (D) $y-x$ (E) None of the above

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20. The number of positive integers k for which the equation $kx-12=3k$ has an integer solution for x is

(A) 3 (B) 4 (C) 5 (D) 6 (E) None of the above

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21. Which of the following is the prime decomposition of the integer 2014?

(A) $2\cdot 11\cdot 23$ (B) $2\cdot 19\cdot 53$ (C) $2\cdot 3\cdot 167$ (D) $2\cdot 1007$ (E) None of the above

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