OU Math Day 2017

Algebra I Test

(with answers on the last page)

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1. All of the solutions to the equation $\sqrt{x} = 36$ are:

   (A) $x = 6$ and $x = -6$ (B) $x = 1296$ (C) $x = 0$ and $x = 6$ (D) $x = 216$
   (E) None of the above

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2. On a 25-question test, a student scores four points for each correct answer and loses two points for each incorrect answer. Jacki answered every question on the test and obtained a score of 64 points. How many questions did she answer correctly?

   (A) 6 (B) 17 (C) 18 (D) 19 (E) None of the above

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3. What is the value of 0.00025×0.004 ?

   (A) 0.000001 (B) 0.001 (C) 0.0000001 (D) 0.00000001 (E) None of the above

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4. A number is eighteen less than 7 times itself. What is the number?

   (A) 1 (B) 2.5 (C) 3 (D) 4.5 (E) None of the above

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5. Which of the following is **NOT** equal to $\frac{2}{5} + \frac{3}{12}$?

   (A) $\frac{1}{10} + \frac{11}{20}$ (B) $\frac{1}{2} + \frac{3}{20}$ (C) $\frac{5}{4} - \frac{3}{5}$ (D) $\frac{1}{3} + \frac{19}{60}$ (E) None of the above

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6. The square root of 8 more than a positive whole number equals 45. What is the number?

(A) 1369 (B) $\sqrt{53}$ (C) 253 (D) 2017 (E) None of the above

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7. If $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{1}{2}$ of a number equals 5, then what is 2 times $\frac{1}{8}$ of $\frac{4}{5}$ of the number?

(A) 1 (B) 4 (C) 6 (D) 8 (E) None of the above

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8. When Sally looks at her clock it's 11:03 AM on November 16. What time of day will it be 2017 hours later?

(A) 11:03 PM (B) 12:03 PM (C) 10:03 AM (D) 7:03 PM (E) None of the above.

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9. If $17 - 3s = 2$ then what does s equal?

(A) -5 (B) 19/3 (C) $-19/3$ (D) 5 (E) None of the above

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10. Simplify the fraction $\dfrac{\frac{1}{2} + \frac{9}{16}}{1 - \frac{3}{8}}$.

(A) 85/128 (B) 1.7 (C) $-20/9$ (D) $-85/48$ (E) None of the above

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11. There are 100 cars on a used car lot. Of these, 35 cars are Fords, 42 are Hondas, and 45 are red. There are 18 red Fords, and 20 red Hondas. How many cars are neither red nor a Ford or Honda?

(A) 0 (B) 7 (C) 11 (D) 16 (E) None of the above

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12. The equation $x^2(x^2-2)(x^2-4)^3 = 0$ has exactly five distinct real solutions. What is the sum of all five of these solutions?

(A) 0 (B) $2\sqrt{2}$ (C) $4+2\sqrt{2}$ (D) $2+\sqrt{2}$ (E) None of the above

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13. Of the five numbers $\frac{5}{11}$, $\frac{4}{13}$, $\frac{5}{12}$, $\frac{6}{19}$ and $\frac{4}{12}$, which is smallest?

(A) $\frac{5}{11}$ (B) $\frac{4}{13}$ (C) $\frac{5}{12}$ (D) $\frac{6}{19}$ (E) $\frac{4}{12}$

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14. Each boy in a family has as many sisters as brothers, but each sister has only half as many sisters as brothers. How many siblings are in this family?

(A) 5 (B) 6 (C) 9 (D) 10 (E) None of the above

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15. Determine the smallest whole number larger than 100 that has remainder of 1 when divided by both 3 and 7?

(A) 169 (B) 116 (C) 148 (D) 127 (E) None of the above

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16. A **twin prime** is a prime number that is either 2 less or 2 more than another prime number. Is 2017 a twin prime?

(A) Yes (B) No

17. Which of the following equals

$$\frac{1}{\sqrt{12}+\sqrt{4}} + \frac{1}{\sqrt{20}+\sqrt{12}} + \frac{1}{\sqrt{28}+\sqrt{20}} + \frac{1}{\sqrt{36}+\sqrt{28}} ?$$

(A) 1 (B) $\sqrt{44}$ (C) 4 (D) 1/2 (E) None of the above

18. How many positive integer divisors does 24^4 have (including 1 and 24^4 itself)?

(A) 32 (B) 48 (C) 59 (D) 65 (E) None of the above

19. Express the number $(3^{1/3} \cdot 9^2 \cdot \sqrt{3} \cdot 3^{-1})/27$ as a power of 3.

(A) $3^{-1/2}$ (B) $3^{5/6}$ (C) $3^{1/6}$ (D) $3^{-2/3}$ (E) None of the above

20. The sum of two numbers is 21. One number is four more than the other. What are the numbers?

(A) 6 and 15 (B) 8 and 13 (C) 25/3 and 37/3 (D) 17/2 and 25/2
(E) None of the above

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21. What is the units digit of 3^{2017}?

(A) 1 (B) 3 (C) 7 (D) 9 (E) None of the above

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22. How many seven-digit positive whole numbers are there whose digits are strictly decreasing in value when read from left to right?

(A) 36 (B) 72 (C) 84 (D) 120 (E) None of the above

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23. Michael' s eleven digit telephone number equals the square of $111,111$. Given that he lives in the USA, what is his area code?

(A) 673 (B) 234 (C) 111 (D) 405 (E) None of the above

Answers for the 2017 Algebra I Test:

1-5:	BDCCA
6-10:	CBDAC
11-15:	ACDBD
16-20:	CEDDB
21-25:	BCCCA
26:	E
