

OU Math Day 2004
Algebra 1 Test

1. The average of two positive numbers is 8 and their product is 48. What are the values of the two numbers?

(A) 6 and 8 (B) 6 and 10 (C) 3 and 16 (D) 4 and 12 (E) None of the above

2. If $25 - 2p = 3$ then what does p equal?

(A) 28 (B) 11 (C) 22 (D) -11 (E) None of the above

3. A bicyclist rides for 10 miles against the wind then turns around and travels the same 10 miles in reverse direction. If the rider averages 20 miles per hour on the first leg of the trip and 10 miles per hour on the second leg, what is the average speed for the entire trip?

(A) $16\frac{2}{3}$ miles/hour (B) 18 miles/hour (C) $13\frac{1}{3}$ miles/hour (D) 15 miles/hour
(E) None of the above

4. Of the integers between 1 and 2000 how many are divisible by at least five distinct primes?

(A) 0 (B) 1 (C) 21 (D) 32 (E) None of the above

5. Which of the following is **NOT** equal to $\frac{2}{3} + \frac{1}{4}$?

(A) $\frac{4}{6} + \frac{1}{4}$ (B) $\frac{7}{12} + \frac{4}{12}$ (C) $\frac{1}{7} + \frac{2}{7}$ (D) $1 - \frac{1}{12}$ (E) $\frac{1}{6} + \frac{3}{4}$

6. If $\frac{1}{2x-5} = \frac{3}{7}$, then what is x ?

- (A) $\frac{11}{3}$ (B) 2 (C) $\frac{19}{7}$ (D) $\frac{5}{2}$ (E) None of the above
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7. The factorization of $6x^2 - 7x + 2$ is:

- (A) $(2x-1)(3x-2)$ (B) $(2x+2)(3x+1)$ (C) $(3x-1)(2x-2)$
(D) $(6x-1)(x-2)$ (E) None of the above
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8. Of the five numbers $\frac{13}{18}$, $\frac{13}{17}$, $\frac{12}{17}$, $\frac{12}{18}$ and $\frac{11}{15}$, which is largest?

- (A) $\frac{13}{18}$ (B) $\frac{13}{17}$ (C) $\frac{12}{17}$ (D) $\frac{12}{18}$ (E) $\frac{11}{15}$
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9. Which of the following equations is **NOT** an identity which holds true for all numbers x and y ?

- (A) $x^2 - y^2 = (x-y)(x+y)$ (B) $x + y = y + x$ (C) $\sqrt{x^2 + y^2} = x + y$
(D) $(x-y)(x-3y) = x^2 - 4xy + 3y^2$ (E) None of the above
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10. The number $\frac{2}{\sqrt{28} - \sqrt{24}}$ can be simplified to:

- (A) $\sqrt{7} + \sqrt{6}$ (B) 4 (C) $\sqrt{28}$ (D) $-2\sqrt{6}$ (E) None of the above
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11. The decimal form for the number $625^{-1/2}$ is

- (A) .1 (B) .04 (C) .4 (D) -.4 (E) None of the above
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12. If $x = 2$ is a solution to the equation $x^3 + 3x^2 + Bx - 3 = 0$ then what must B equal?

- (A) $23/2$ (B) $-23/2$ (C) 2 (D) $-17/2$ (E) None of the above
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13. In planning for a wilderness trip, a guide estimates that 9 pounds of food and water will be needed each day for every 4 people. If 30 people are to go on a 10 day excursion, how many pounds of food and water should the guide plan on carrying?

- (A) 145 (B) 1005 (C) 675 (D) 100.5 (E) None of the above
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14. Which of the following is the prime decomposition of the integer 71400?

- (A) $2^2 \cdot 3 \cdot 5 \cdot 7 \cdot 17$ (B) $8 \cdot 3 \cdot 5^2 \cdot 17$ (C) $2^3 \cdot 3 \cdot 5^2 \cdot 13^2$
(D) $2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13$ (E) None of the above
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15. If $x = 4.001$ what integer is nearest to the value of $\frac{x-4}{\sqrt{x}-2}$?

- (A) 0 (B) 4 (C) 10 (D) 96 (E) None of the above
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16. All of the solutions to the equation $x + 1 = \frac{4+x}{x}$ are:

- (A) $x = 2$ (B) $x = 0$ (C) $x = 2$ and $x = -2$ (D) $x = -4$ and $x = 2$
(E) None of the above
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