Practice Set 5

1. For all x, $(3x + 4)(4x - 3) =$

   (A) $7x + 1$
   (B) $7x - 12$
   (C) $12x^2 - 12$
   (D) $12x^2 - 25x - 12$
   (E) $12x^2 + 7x - 12$

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2. If $2x + 4 = 12$, then $x =$

   (A) 8
   (B) 7
   (C) 6
   (D) 5
   (E) 4

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3. Vito read 96 pages in 2 hours and 40 minutes. What was Vito's average rate of pages per hour?

   (A) 24
   (B) 30
   (C) 36
   (D) 42
   (E) 48

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4. Bob drove his car 250 miles at 50 mph. How long did he drive (in hours)?

   (A) 4
   (B) 5
   (C) 6
   (D) 7
   (E) 8

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5. What is the value of a if $ab + ac = 21$ and $b + c = 7$?

   (A) –3
   (B) –1
   (C) 0
   (D) 1
   (E) 3

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6. **A freight car weighs 2,000 lb. before freight is added. When 200 lb. of freight is added, the total weight is 4 times the weight of the caboose. How much does the caboose weigh, in pounds?**

   (A) 500
   (B) 550
   (C) 1,220
   (D) 2,200
   (E) 8,800

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7. **If $xyz \neq 0$, which of the following is equivalent to $\frac{x^2y^3z^4}{(xyz^2)^2}$?**

   (A) $\frac{1}{y}$
   (B) $\frac{1}{z}$
   (C) y
   (D) $\frac{x}{yz}$
   (E) xyz

8.
   1. **Add eight to x**
   2. **Subtract y**
   3. **Multiply the total by 2**

   If the steps above are followed what is the resultant expression?

   (A) $x + y - 16$
   (B) $x - y + 8$
   (C) $2x - 2y + 16$
   (D) $2x + 2y + 16$
   (E) $2x - y + 16$

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9. **The equation $x^2 = 5x - 4$ has how many distinct real solutions?**

   (A) 0
   (B) 1
   (C) 2
   (D) 3
   (E) Infinitely many

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10. If $4x + 4 = 12x + 12$, then $x =$

(A) -2
(B) -1
(C) 0
(D) 1
(E) 3

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11. Martin's average (arithmetic mean) score after 4 tests is 89. What score on the 5th test would bring Martin's average up to exactly 90?

(A) 90
(B) 91
(C) 92
(D) 93
(E) 94

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12. In a class of 350 people there are 50 more right handed than left handed people. Of the right handed people there are 20 more males than females. How many right-handed females does the class contain?

(A) 85
(B) 90
(C) 105
(D) 110
(E) 125

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13. If $abc \neq 0$, then $\dfrac{a^2bc + ab^2c + abc^2}{abc} =$

(A) $a + b + c$
(B) $a + b + cabc$
(C) $a^3b^3c^3$
(D) $3abc$
(E) $2abc$

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14. If $4a - b \leq 0$ and $b \leq 2$, what is the greatest possible value of $4a$?

(A) 3
(B) 2
(C) 1
(D) 0
(E) 0.5

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15. A lighthouse blinks regularly 5 times a minute. A neighboring lighthouse blinks 4 times a minute. If they blink simultaneously, after how many seconds will they blink together again?

(A) 20
(B) 24
(C) 30
(D) 60
(E) 300

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16. If a is the product of b and 4 less than $3b$, then $\frac{a}{b} =$

(A) $3b - 4$
(B) $b - 4$
(C) $3b + 4$
(D) $b + 4$
(E) $\frac{4b - 4}{b}$

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17. If $x \blacklozenge y = (x - y)^2$ for all integers, which of the following must be true?

I. $x \blacklozenge y = y \blacklozenge x$
II. $x \blacklozenge y = x \blacklozenge (-y)$
III. $x \blacklozenge (-y) = (-x) \blacklozenge y$

(A) I only
(B) III only
(C) I and II
(D) I and III
(E) II and III

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18. If $\frac{c}{3d} = \frac{3d}{c}$, and $c = 18$, then $d =$

(A) 324
(B) 36
(C) 18
(D) 6
(E) 3

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19. At a fruit stand, the price of one pound of cherries is twice the price of one pound of grapes. If 32 pounds of cherries and 8 pounds of grapes were sold and sales totaled $90.00, how much more money was made on the cherries than on the grapes?

(A) $75.00
(B) $70.00
(C) $65.00
(D) $60.00
(E) $55.00

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20. If the average of 6 numbers is a, and the average of 4 of the numbers is $a - 4$, then the average of the remaining 2 numbers is

(A) $2a + 16$
(B) $a + 16$
(C) $a + 8$
(D) $a + 2$
(E) $a - 8$

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21. If the sum of 5 different positive integers is 100, what is greatest possible value for the median of the 5 integers?

(A) 31
(B) 32
(C) 33
(D) 34
(E) 50

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22. A jar of 100 coins contains only pennies and quarters. If the jar contains $19.00 worth of coins, how many pennies does it contain?

(A) 10
(B) 25
(C) 50
(D) 75
(E) 100

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23. If $r < 0$ and $(4r - 4)^2 = 36$, what is the value of r?

(A) -2
(B) -1
(C) $-\frac{1}{2}$
(D) $-\frac{1}{4}$
(E) $-\frac{1}{8}$

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24. On a basketball team, there are 8 sophomores, 12 juniors, and 10 seniors. How many sophomores must be added to make the team 50% sophomores?

(A) 7
(B) 8
(C) 10
(D) 12
(E) 14

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25. Five liters of water were poured from tank A into tank B, and 10 liters of water were then poured from tank A into tank C. If tank A originally had 10 more liters of water than tank C, how many more liters of water does tank C now have than tank A?

(A) 0
(B) 5
(C) 10
(D) 15
(E) 20
