ALGEBRA I INDIVIDUAL TEST
JANUARY REGIONAL COMPETITION

1) Simplify: $2 + 16 \div 3 - 5 + 6 \div \frac{2}{3}$

a) 10 b) $6\frac{1}{3}$ c) $11\frac{1}{3}$
d) $-7\frac{1}{3}$ e) nota

2) Simplify: $-2(3x - 5) + 8 - 3(2x + 1)$

a) $-12x + 1$ b) $4x + 15$
c) $-12x + 21$ d) $-12x + 15$ e) nota

3) What property or axiom is shown:
$15\,(7 \times \frac{1}{7}) = 15\,(1)$

a) Multiplicative Inverses
b) Distributive Axiom
c) Associative Axiom of Multiplication
d) Multiplicative Identity
e) nota

4) Solve:
$3(1 + n) = 2[3(n+2) - (n+1)]$

a) $\{-5\}$ b) $\{-7\}$ c) $\{-4\}$
d) $\{-7/3\}$ e) nota

5) What is the solution of:

$1 - 2x > 7$ or $1 - 2x < -1$

a) { }

b) $-3 < x < 1$

c) $x < -3$ or $x > 1$

d) $x < -4$ or $x > 0$

e) nota

6) Jeff is six years older than Amy, and the average of their ages is twice Amy's age. What is the product of their present ages?

a) 27 b) 18 c) 9
d) 6 e) nota

7) Find the range of $3x - 2y = 12$ if the domain is $\{4, -6\}$.

a) {0} b) $\{0, -15\}$ c) {12}
d) $\{4, -6\}$ e) nota

8) Find the sum of the integral solutions of:

$|-2x - 3| - 8 < -1$

a) 0 b) 9 c) -9
d) infinite e) nota

9) Find the value of c so that the line containing the points (c, 3) and $(-2, -1)$ has a slope of $-\frac{4}{5}$

a) $-\frac{18}{5}$ b) -7 c) $\frac{6}{5}$
d) $-\frac{26}{5}$ e) nota

10) Find the y - intercept of the line which contains the points (10, 3) and (12, -2)

a) 7 b) 28 c) 56/5
d) 64/5 e) nota

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11) Solve the following system for (a,b). What is the value of a - b ?

$\frac{2a}{3} - \frac{b}{5} = 2 \qquad \frac{2a}{3} + b = -1$

a) $\frac{17}{8}$ b) $\frac{-37}{8}$ c) $\frac{19}{4}$ d) $\frac{-31}{4}$ e) nota

12) The number of adults at the lake is three less than twice the number of children. If a total of 51 people are at the lake, how many more adults are there than children?

a) 19 b) 18 c) 6 d) 3 e) nota

13) Simplify:

$(-10x^2 + 12x - 20) - (-3x^2 + 12x - 8)$

a) $-13x^2 + 24x - 28$ b) $7x^2 - 12$
c) $-7x^2 + 24x - 12$ d) $-7x^2 - 12$
e) nota

14) Simplify:

$$\frac{2x^2 - x - 3}{4x^2 - 5x + 1} \cdot \frac{x^2 - 1}{(x+1)^2} \cdot \frac{1 - 3x - 4x^2}{3 - 5x + 2x^2}$$

a) $\frac{1+x}{1-x}$ b) $\frac{x+1}{x-1}$ c) $\frac{1}{1-x}$ d) $\frac{1}{x-1}$ e) nota

15) In a group of 154 students, there are 14 more girls than boys. What part of the group are boys?

a) 5/6 b) 5 / 14 c) 6 / 11 d) 5/ 11 e) nota

16) Factor the trinomial below into the form $(Ax + B)(Cx + D)$. What is the value of $A + B + C + D$?

$36x^2 - 33x - 20$

a) 24 b) 16 c) 14 d) 6 e) nota

17) Max averaged 60 km/hr in driving from his house to the airport, but he arrived 10 minutes late. If he had averaged 96 km/hr, he would have been 5 minutes early. Find the distance from his house to the airport.

a) 25 km b) 40 km c) 160 km d) 800 km e) nota

18) It takes one painter 10 hours to paint an entire classroom. After he has been at work for 4 hours, another painter comes to help. The 2 painters then complete the job in 2 more hours. How long would the second painter have taken to paint the entire room all by himself?

a) 10 hours b) 3 hr 20 min c) 5 hrs d) 1 hr 40 min e) nota

19) Simplify:

$2\sqrt{128} - 3\sqrt{242} + 6\sqrt{72}$

a) 19 b) $11\sqrt{2}$ c) $-5\sqrt{2}$ d) $-11\sqrt{2}$ e) nota

20) Simplify: $\frac{(x^2y^3)^{-2} \cdot (x^3y^{-3})^2}{(x^4y^2)^{-3}\,(x^{-3}y^2)^{-2}}$

a) x^8y^{-2} b) $x^{-8}y^2$ c) x^2y^8 d) $x^{-2}y^{-8}$ e) nota

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21) Which of the following sets of numbers contains π ?

a) {Integers} b) { Naturals}
c) { Rationals} d) {Irrationals} e) nota

22) Simplify:

$$\frac{2}{x-3} - \frac{7x-3}{x^2+3x-18}$$

a) $\frac{-5}{x+6}$ b) $\frac{5x+9}{x^2+3x-18}$ c) $\frac{-5x+9}{x^2+3x-18}$

d) $\frac{5x+15}{x^2+3x-18}$ e) nota

23) Solve:

$$\frac{x}{x+1} - \frac{x+1}{x-4} = \frac{5}{x^2-3x-4}$$

a) $\{-1\}$ b) $\{-2\}$ c) $\{-1.2\}$
d) $\{\ \}$ e) nota

24) The difference between two numbers is seven. Their sum is 37. What is their product ?

a) 259 b) 154 c) 330
d) 105 e) nota

25) Given $xy = 7$, and

$x^2y + xy^2 - x - y = 24$,

find $x^2 + y^2$

a) 2 b) 4 c) 16 d) 24 e) nota

26) Find the GCF of:

$216x^3y^2z$ and $144x^2y^3$

a) $36x^2y^2z$ b) $72xyz$ c) $72x^2y^2$
d) $432x^3y^3z$ e) nota

27) Find the sum of the roots of:

$x^2 - 5x - 14 = 0$

a) 0 b) -5 c) 10 d) 5 e) nota

28) If $a = 7$ and $b = 9$, find the value of

$$\frac{\frac{a}{a+b}}{a - \frac{a}{b}}$$

a) $\frac{4}{5}$ b) -1 c) 0 d) $\frac{5}{4}$ e) nota

29) Complete the square: $x^2 + 8x +$ _____

a) 2 b) 4 c) 8 d) 64 e) nota

30) Solve for x: $\frac{ab}{x} = \frac{b}{a}$

a) $x = a^2$ b) $x = b^2$ c) $x = a^2b$
d) $x = b$ e) nota