ALGEBRA 1 NAME _____
Second Semester Study Guide PERIOD _____

1) Find the prime factorization of 91.

2) Find the GCF of $-35a^2$ and $56ab$.

3) Factor completely $44x^2y^2 + 12x^2y - 16xy^2$.

4) Solve $25x^2 - 100x = 0$.

5) Solve $y^2 = 14y - 48$.

6) Factor completely $5d^2 + 6d - 8$.

7) Factor completely $y^2+13y+30$

8) Factor completely $b^2 + b - 20$.

9) Factor completely $5x^2 - 9x + 4$.

10) Factor completely, if possible. If polynomial cannot be factored, choose *prime*. $90x^2y - 100xy^2$.

11) Factor $x^2 - 6x - 27$

12) Simplify $\frac{20x^2y}{35xy^2}$.

13) State the excluded values of $\frac{a^2 + 3a - 28}{a^2 - 3a - 4}$.

14) Simplify $\frac{6x^2 - 10x + 4}{2x^2 - 6x + 4}$.

15) Simplify $\dfrac{x^4}{7x^2 - 7y^2} \bullet \dfrac{x + y}{x^5 + x^4}$.

16) Simplify $\frac{8m^2n}{p^2} \div \frac{m^3n^2}{6p^5}$.

17) Factor $x^2 - 7x + 12$

18) Simplify $\frac{5x}{x+1} + \frac{2x}{x+1}$.

19) Simplify $\frac{x - 5}{9} - \frac{x - 6}{9}$.

20) Simplify $5\sqrt{7} - 2\sqrt{7}$

21) If $x = 3$ and $3x + y = 7$, what is the value of y?

22) Solve the system $n = 4m - 14$
$2m + 3n = 0$

23) Solve the system

$$x + 7y = 12$$
$$x + 6y = 9$$

24) To eliminate the variable y in the system of equations, Multiply the second equations by what number?

$8x + 6y = 24$
$4x - 3y = 12$

25) Find the two numbers whose sum is 36 and whose difference is 24.

26) If $x = 3y + 6$ and $2x - 5y = 10$, what is the value of y?

$2(3y+6)-5y=10$

$6y+12-5y=10$

$y+12=10$

$-12 \quad -12$

$y=-2$

27) Simplify $(x^5)^3$

x^{15}

28) Solve the system for y

$2(6x + 8y = -24)$ and
$-3(4x - 10y = 156.)$

$$12x + 16y = -48$$
$$-12x + 30y = -468$$

$$46y = -516$$

$$\frac{46y}{46} = \frac{-516}{46}$$

$$y = \frac{-258}{23}$$

29) Express 6.32×10^{-5} in standard notation

0.0000632

30) Simplify $\sqrt{160}$

$\sqrt{16}\sqrt{10}$

$4\sqrt{10}$

31) Simplify $(4d^4)(-3d^3)$.

$-12d^7$

32) Simplify $(-3xy^3)^2(4x^4y^2)^3$.

$((-3)^2x^2y^6)(4^3x^{12}y^6)$

$(9x^2y^6)(64x^{12}y^6)$

$576x^{14}y^{12}$

33) Simplify $\frac{5n^{-4}y}{10n^{-3}y^{-5}}$. Assume the denominator is not equal to zero.

$$\frac{5yn^3y^5}{10n^4} = \frac{1y^6}{2n}$$

34) Find the degree of the polynomial $5x^3y^2 - 4x^2y^2 + 9x^4y^2$.

5 4 6

6

35) Arrange the terms of $5x^4y^3 + 12x^2y^2 - 3x^3y + 6$ so that the powers of x are in ascending order.

$6 + 12x^2y^2 - 3x^3y + 5x^4y^3$

36) Find $(4c^2 - 9c + 5) + (3c^2 - 9c - 16)$.

$7c^2 - 18c - 11$

37) Find $(x + 3)(x + 7)$.

$x^2+7x+3x+21$

$x^2+10x+21$

38) Find $(5y + 3z)(5y - 3z)$

$25y^2 - 15yz + 15yz - 9z^2$

$25y^2 - 9z^2$

39) Solve $x(2x + 4) - 4 = 2 + x(2x + 1)$

$2x^2 + 4x - 4 = 2 + 2x^2 + x$

$-2x^2 \qquad -2x^2$

$4x - 4 = 2 + x$

$-x \qquad -x$

$3x - 4 = 2$

$+4 \qquad +4$

$3x = 6$

$\frac{3}{3} \quad \frac{6}{3}$

$x = 2$

40) Find $(4x + 3)(2x^2 - 5x - 9)$.

$8x^3 - 20x^2 - 36x + 6x^2 - 15x - 27$

$8x^3 - 14x^2 - 51x - 27$

41) Write $x+\frac{x+4}{x+7}$ as a rational expression.

$$\frac{x(x+7)+x+4}{x+7} = \frac{x^2+7x+x+4}{x+7}$$

$$= \frac{x^2+8x+4}{x+7}$$

42) Simplify $\sqrt{200}$

$\sqrt{100} \cdot \sqrt{2}$

$10\sqrt{2}$

43) Simplify $\sqrt{50x^{10}y^5}$

$\sqrt{25}\cdot\sqrt{2}\sqrt{x^{10}y^5}$

$5x^5y^2\sqrt{2y}$

44) Determine whether the following side measures form a right triangle.

14, 48, 50

$a^2+b^2=c^2$

$14^2+48^2=50^2$

$196+2304=2500$

$2500=2500$

Yes

45) Find the distance between the pair or points whose coordinates are given

(7, 3), (-4, 11)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-4-7)^2 + (11-3)^2}$$

$$d = \sqrt{(-11)^2 + (8)^2}$$

$$d = \sqrt{121 + 64}$$

$$d = \sqrt{185} \approx 13.6$$

46) Simplify $\frac{8}{3 - \sqrt{2}} \cdot \frac{3+\sqrt{2}}{3+\sqrt{2}}$

$$\frac{24+8\sqrt{2}}{9-\sqrt{4}} = \frac{24+8\sqrt{2}}{7}$$

47) Simplify $2\sqrt{50} - 3\sqrt{32}$

$2\sqrt{25}\sqrt{2} - 3\sqrt{16}\sqrt{2}$

$2 \cdot 5 \cdot \sqrt{2} - 3 \cdot 4\sqrt{2}$

$10\sqrt{2} - 12\sqrt{2}$

$-2\sqrt{2}$

48) Solve ~~$\sqrt{3x-3}-6=9$~~

$\sqrt{3x-3}-6=-3$

$+6 \quad +6$

$(\sqrt{3x-3})^2=(3)^2$

$3x-3=9$

$+3 \quad +3$

$3x=12$

$3 \quad 3$

$x=4$

✓ $\sqrt{3(4)-3}-6=-3$

$\sqrt{12-3}-6=-3$

$\sqrt{9}-6=-3$

$3-6=-3$

$-3=-3$

49) If c is the measure of the hypotenuse of a right triangle, find the missing value. If necessary, round to the nearest hundredth.
a = 8, b = 15, c = ?

$a^2 + b^2 = c^2$

$8^2 + 15^2 = c^2$

$64 + 225 = c^2$

$289 = c^2$

$\sqrt{289} = \sqrt{c^2}$

$17 = c$

50) If c is the measure of the hypotenuse of a right triangle, find the missing value. If necessary, round to the nearest hundredth.

c = 14, a = 9, b = ?

$a^2 + b^2 = c^2$

$9^2 + b^2 = 14^2$

$81 + b^2 = 196$

$-81 \qquad -81$

$b^2 = 115$

$\sqrt{b^2} = \sqrt{115}$

$b \approx 10.72$