Algebra
2nd Semester Review 2005

Name_____
Block_____

Non-calculator

(6.2) 1. Classify $\sqrt{4}$ as rational or irrational. [1] _____

(6.2) 2. Which of the following is an irrational number?

[A] $-\sqrt{4}$ [B] 3.14 [C] $-\frac{1}{\sqrt{9}}$ [D] $\sqrt{14}$

[2] _____

Simplify:

(6.3) 3. $\sqrt{175}$ [3] _____

(6.3) 4. $\sqrt{\frac{9}{16}}$ [4] _____

(6.3) 5. $\sqrt{12}-\sqrt{3}$ [5] _____

(6.3) 6. $\sqrt{72}+\sqrt{18}$ [6] _____

(6.4) 7. $4(9x+1)$ [7] _____

(6.4) 8. $(x-6)(x-2)$ [8] _____

(6.5) 9. $(p-2)^2$ [9] _____

(6.5) 10. $(4t+7)(4t-7)$ [10] _____

(6.5) 11. $(2x+1)(3x+8)$ [11] _____

Solve the System:

(7.2) 12. $\begin{aligned} 4x+3y &= -14 \\ 8x-2y &= 12 \end{aligned}$ [12] _____

(7.2) 13. $\begin{aligned} y &= 3x-9 \\ x+2y &= 10 \end{aligned}$ [13] _____

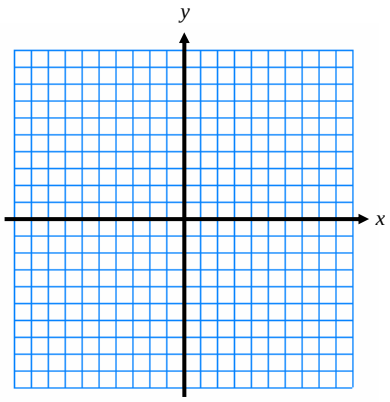
(7.4) 14. Determine whether the following system has one solution, no solutions, or infinitely many solutions.

$$-2x+4y=-8$$
$$6x-12y=48$$

[A] no solutions [B] infinitely many solutions [C] one solution [D] none of these

[14] _____

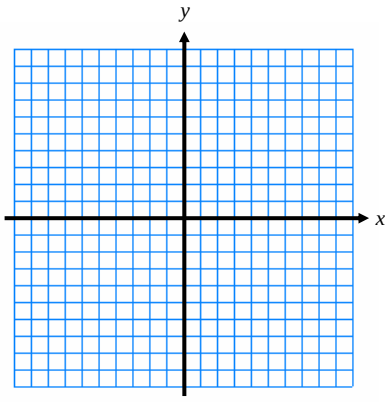
(7.1) 15. Graph: $5x - 3y = -15$ [15]



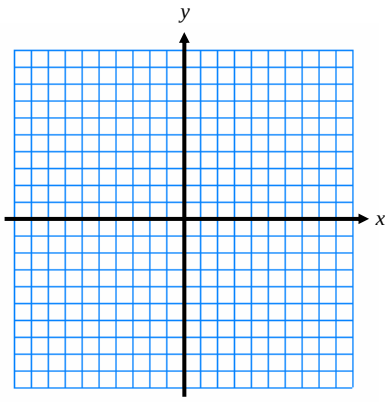
(7.2) 16. Solve graphically. [16] _____

$y = x - 7$

$x + 2y = 10$



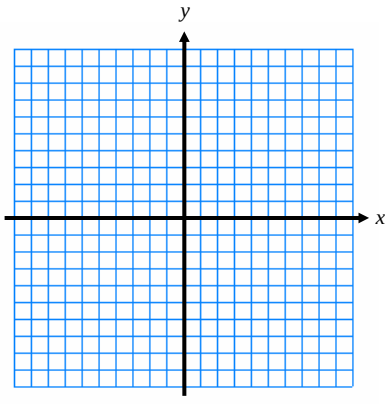
(7.5) 17. Graph: $y > -3x + 4$ [17]



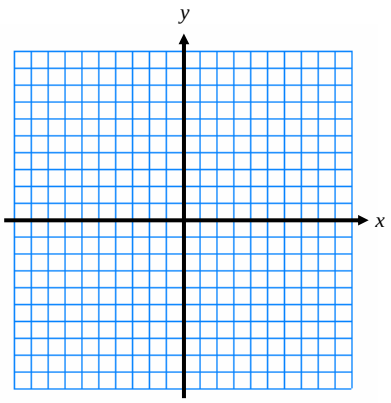
(7.6) 18. Graph the system of inequalities. [18]

$y < \frac{-2}{3}x + 4$

$2x - 5y \leq 20$



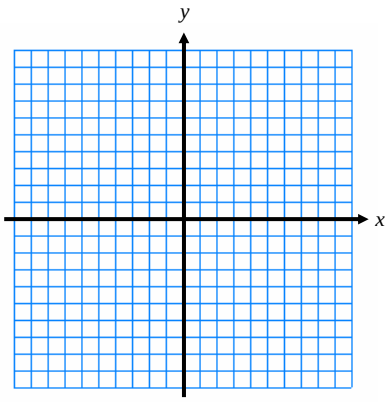
(8.1) 19. Graph $y = |-3x| + 4$. Tell whether the equation is linear or nonlinear.



[19]_____

(8.1) 20. Sketch the graph of the equation $y = \frac{-1}{2}x^2$.

[20]



(8.2) 21. Predict how the graph of the equation $y = 3x^2$ will compare with the graph of the equation $y = x^2$.

[A] The graph of $y = 3x^2$ will open up because the coefficient is positive. The graph will be narrower because 3 is greater than 1.

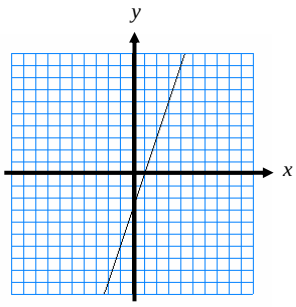
[B] The graph of $y = 3x^2$ will open up because the coefficient is positive. The graph will be wider because 3 is greater than 1.

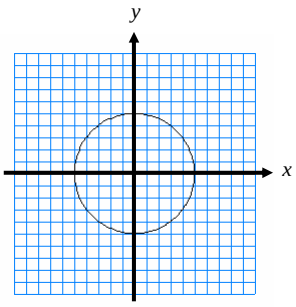
[C] The graph of $y = 3x^2$ will open down because the coefficient is positive. The graph will be wider because 3 is greater than 1.

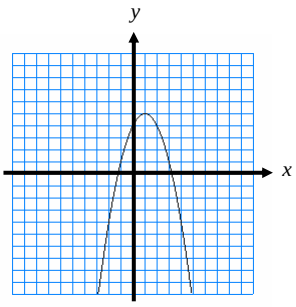
[D] The graph of $y = 3x^2$ will open down because the coefficient is positive. The graph will be narrower because 3 is greater than i.

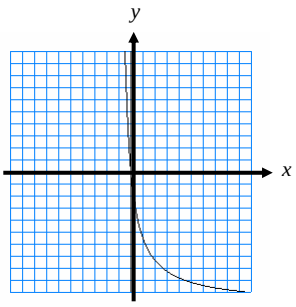
[21] _____

(8.1) 22. Determine which of the following graphs is linear.

[A] 

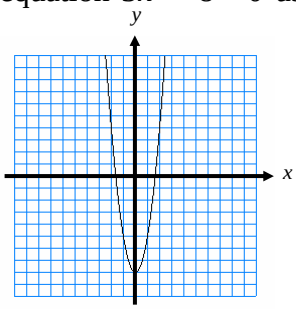
[B] 

[C] 

[D] 

[22] _____

(8.2) 23. Estimate the solutions of the equation $3x^2 - 8 = 0$ using the related graph shown below.



[A] -8 [B] no solution [C] 1.63,-1.63 [D] 2.67, -2.67

[23] _____

(8.3) 24. Solve for x: $2x^2 = 128$ [24] _____

(8.5) 25. Solve by quadratic formula: $2x^2 + 5x - 25 = 0$ [25] _____

(8.5) 26. Solve by the quadratic formula: $x^2 - 6x = -9$ [26]_____

(8.6) 27. Find the discriminant: $3x^2 + x + 2 = 0$ [27] _____

(8.6) 28. Find the discriminant: $3x^2 - 5x - 2 = 0$ [28] _____

[A] 70 [B] -49 [C] -70 [D] 49

(8.4) 29. Determine the number of solutions of the equation: $2x^2 + x + 2 = 0$

[A] 4 [B] 0 [C] 1 [D] 2

[29] _____

(8.4) 30. Determine the number of solutions of the equation. [30] _____
$-4x^2 - 8x = 4$

(9.1) 31. Rewrite using exponents: (0.024)(0.024)(0.024)(0.024)(0.024)(0.024)

[A] $6^{(0.024)}$ [B] $(0.024)^{-6}$ [C] $(0.024)^6$ [D] $(0.24)^6$

[31] _____

(9.1) 32. Evaluate the expression: $\left(\frac{7}{8}\right)^2$ [32] _____

[A] $\frac{49}{8}$ [B] $\frac{49}{64}$ [C] $\frac{7}{64}$ [D] $\frac{7}{4}$

(9.1) 33. Evaluate: $(-3)^3$ [33] _____

[A] 9 [B] -9 [C] 27 [D] -27

(9.1) 34. Evaluate when $x = 3$ and $y = 5$: $y^2 - x^3$ [34] _____

(9.4) 35. Rewrite using only positive exponents and simplify 7^{-2}. [35] _____

[A] $-\frac{1}{14}$ [B] $\frac{1}{49}$ [C] $-\frac{1}{49}$ [D] $\frac{1}{14}$

For 36-37, express answer as a fraction.

(9.4) 36. Evaluate when $x = 4$ and $y = 5$: $x^{-2}y^{0}$ [36] _____

(9.4) 37. Evaluate: $\left(\frac{3}{8}\right)^{-2}$ [37] _____

(9.4) 38. Evaluate: $x^{2} \cdot x^{-6}$ [38] _____

[A] x^{12} [B] x^{4} [C] $\frac{1}{x^{12}}$ [D] $\frac{1}{x^{4}}$

(9.4) 39. Simplify: $(5x^{4}y)(-2x^{2}y^{4})$ [39] _____

(9.4) 40. Simplify: $(-4x^{4}y^{2})(6xy^{-9})$ [40] _____

(9.4) 41. Rewrite using only positive exponents: $8ab^{4}c^{-2}$ [41] _____

[A] $\frac{1}{8ab^{4}c^{2}}$ [B] $\frac{8ab^{4}}{c^{2}}$ [C] $\frac{c^{2}}{8ab^{4}}$ [D] $\frac{8a}{b^{4}c^{2}}$

(9.4) 42. Simplify: $(p^{2}r^{3})^{9}$ [42] _____

(9.6) 43. Simplify: $\left(\frac{s^{8}}{t^{5}}\right)^{4}$ [43] _____

[A] $\frac{s^{12}}{t^{9}}$ [B] $\frac{s^{32}}{t^{20}}$ [C] $\frac{s^{32}}{t^{5}}$ [D] $s^{32} + t^{20}$

(9.5) 44. Write 6,330 in scientific notation. [44] _____

[A] 633×10 [B] 63.3×10^{2} [C] $.633 \times 10^{4}$ [D] 6.33×10^{3}

(9.5) 45. Write in decimal notation: 410×10^{-4} [45] _____

[A] 0.041 [B] $-4{,}100{,}000$ [C] 4,100,000 [D] 0.0041

(9.7) 46. Simplify using only positive exponents: $\dfrac{7a^3b^{-9}}{49a^{-5}b^5}$ [46] _____

(9.7) 47. Simplify using only positive exponents: $\dfrac{6a^{-8}b^2}{36a^7b^{-8}}$ [47] _____

(10.1) 48. Which of the following expressions is NOT a polynomial?

[A] $18x^2 + \dfrac{x}{9}$ [B] $\dfrac{x-4}{2}$ [C] $5x + 7x^3$ [D] $\dfrac{x+3}{x}$

[48] _____

(10.1) 49. Give the degree of the polynomial: $4x^3 + 5 - 6x^5 + 2x$ [49] _____

[A] 5 [B] 4 [C] 3 [D] 9

Add:

(10.1) 50. $\left(2x^2 - 4x + 5\right) + \left(-5x^2 - x + 4\right)$ [50] _____

(10.1) 51. $\left(x^2 - 4x + 4\right) + \left(3x^2 - 3x + 2\right)$ [51] _____

Subtract:

(10.1) 52. $\left(8x^4 - x\right) - \left(4x + 5 + 6x^4\right)$ [52] _____

(10.1) 53. $\left(4x^2 + 7x\right) - \left(-x + 2 + 6x^2\right)$ [53] _____

Multiply:

(10.2) 54. $2x^3\left(5x^2+4y\right)$ [54] _____

(10.2) 55. $\left(3n-5\right)\left(n^2+4n-6\right)$ [55] _____

(10.2) 56. $\left(-5c^2-2c+7\right)\left(-c+2\right)$ [56] _____

Factor:

(10.3) 57. $4x^3-8x^2+12x$ [57] _____

(10.3) 58. $8x^3-6x^6$ [58] _____

(10.4) 59. x^2-3x+2 [59] _____

(10.5) 60. $x^2+6x-27$ [60] _____

(10.4) 61. $12x^2+35x+18$ [61] _____

(10.5) 62. $18x^2-3x-28$ [62] _____

Solve:

(10.3) 63. $x(5x-8)=0$ [63] _____

(10.3) 64. $(9x-8)(4x+8)=0$ [64] _____

Solve by factoring:

(10.3/10.5) 65. $14h^2=-35h$ [65] _____

(10.5) 66. $2x^2+9x+4=0$ [66] _____

(10.5) 67. $3x^2+14x=5$ [67] _____

(11.1) 68. Write an equation if x and y vary inversely and $y=4$ when $x=5$.

[68] _____

(11.1) 69. Find an equation of variation when y varies inversely as x and $y=2$ when $x=9$.

[69] _____

Solve:

(11.3) 70. $\frac{x}{7}-\frac{x}{11}=4$ [70] _____

(11.3) 71. $\frac{-4x}{x-2}+7=\frac{x}{x-2}$ [71] _____

(11.3) 72. $\frac{3}{2(t+1)}+\frac{5}{4t}=\frac{2}{t}$ [72] _____

(11.4) 73. Solve for t in the formula $A=4s^2t$. [73] _____

(11.4) 74. Solve for s in the equation: $-2=t+9s$

[A] $s=-2-9t$ [B] $s=\frac{-2-t}{9}$ [C] $s=-\frac{-2+t}{9}$ [D] $s=-2-t-9$

[74] _____

(11.4) 75. Solve for i in the equation: $h=\frac{i-j}{j}$ [75] _____

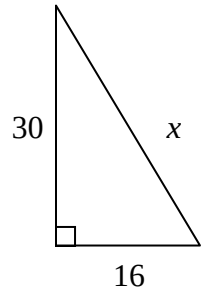
Simplify:

(11.5) 76. $\frac{2q+qr}{5q}$ [76] _____

(11.5) 77. $\frac{3n^2-12n}{15n-60}$ [77] _____

Calculator Allowed

(6.1) 78. Find the unknown length. [78] _____



(6.1) 79. Which set of side lengths cannot form a right angle? [79] _____

[A] 7mm, 8mm, 10mm
[B] 12mm, 16mm, 20mm
[C] 6mm,8mm,10mm
[C] 3mm, 4mm, 5mm

(6.1) 80. A cable 35m long runs from the top of a utility pole to a point on the ground 20m from the base of the pole. How tall is the utility pole, to the nearest tenth of a meter?

[80] _____

(7.4) 81. At a high school football game, 500 tickets were sold. Adult tickets cost $5 and student tickets cost $3. If the total amount collected was $ 2300, how many adult tickets and student tickets were sold?

[81] _____

(8.3) 82. Solve for x: $-4x^2 + 12 = -28$ [82] _____

(8.5) 83. Solve by the quadratic formula: $2x^2 + 5x - 25 = 0$ [83] _____

(9.2) 84. The amount of money, A, accrued at the end of n years when a certain amount, P, is invested at a compound annual rate, r, is given by $A = P(1+r)^n$. If a person invests \$160 at 8% interest compounded annually, find the approximate amount obtained at the end of 10 years.

[84] _____

(9.3) 85. During a drought, the water usage of a city decreased by an average of 4% per year since 1985 when it was 300,000 cubic hundred feet.

a. Write an exponential function to model this situation.

b. Estimate the amount of water used by the city in 1992.

[85]a_____

b_____

(9.2/9.4) 86. The mass y is grams of a colony of bacteria x hours after 9 A.M., May 19, is given by the equation $y = 2.1(1.34)^x$.

a. Estimate the mass at 2 P.M., May 19.

b. Estimate the mass at 6 A.M., May 19.

[86]a_____

b_____

(8.5 /10.5) 87. The equation $h = -16t^2 + 56t$ models the height, h, in feet, of a golf ball t seconds after it was hit.

a. Find the values of t for which $h = 0$.

b. When is the ball 40 ft above the ground?

[87] a_____

b_____

(11.1) 88. The price per person of renting a bus varies inversely with the number of people renting the bus. It costs \$40 per person if 53 people rent the bus. How much will it cost per person if 87 people rent the bus?

[88] _____