BASIC ALGEBRA   EXAM 2 GR R^2 NAME _____

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
TURN IN **ALL** WORKSHEETS. CALCULATORS ARE PERMITTED ON THIS TEST.

In 1 - 7, multiply the expressions:
1. $5(x - 4)$ 2. $(x - 3)(x - 5)$ 3. $(x - 4)(2x + 5)$

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

6. $(5x + 15)(2x + 7)$ 7. $(x + 2)^2$

In 8 - 19, factor completely.
8. $15x + 25y$ 9. $12x^2 - 18x$ 10. $x^2 + 4x - 5$

11. $x^2 - 7x - 8$ 12. $x^2 + 11x + 24$ 13. $x^2 - 13x + 12$

14. $x^2 - 49$ 15. $5x^2 + 8x + 3$ 16. $5x^2 + 15x + 10$

17. $x^3 - 25x$ 18. $x^4 - 81$ 19. $x^4 - 5x^2 + 4$

In 20 - 23, solve for x.
20. $(x - 4)(x + 2) = 0$ 21. $x^2 + 5x = 0$

22. $x^2 + 6 = 5x$ 23. $x(x + 2) = 8$

24. According to the Theorem of a) _____, where "a" and "b" are
    legs and "c" is the b) _____, it may be concluded that
    c) _____.

25. Find x: 26. Find x: 27. Find x:

In 28 - 39, simplify using the laws of exponents. Eliminate all negative
        and zero exponents.

28. $3x^0$ 29. $3x^{-1}$ 30. $(3x)^{-1}$ 31. $(3x)^{-2}$

32. $x^5 \cdot x^2$ 33. $(x^5)^2$ 34. $\dfrac{x^{10}}{x^2}$ 35. $\dfrac{12x^{-4}}{4x^{-6}}$

36. $\dfrac{x^{-4}}{x^6}$ 37. $\left(\dfrac{3}{5}\right)^{-2}$ 38. $(x^4y^{-2})^3$ 39. $\left(2x^3\right)^3$

In 40 - 43, express answers in scientific notation.

40.   65,000,000   41. 0.000425

42.   200,000•8,000,000   43. $\dfrac{0.0003}{60,000}$

BASIC ALGEBRA EXAM 2GR Solutions

1. $5(x-4)$
$\boxed{5x - 20}$

2. $(x-3)(x-5)$
$\boxed{x^2 - 8x + 15}$

3. $(x-4)(2x+5)$
$\boxed{2x^2 - 3x - 20}$

4. $(2x-3)^2 = (2x-3)(2x-3)$
$\boxed{= 4x^2 - 12x + 9}$

5. $(x+4)(x^2-4x+2)$
$x^3 - 4x^2 + 2x$
$\underline{\quad 4x^2 - 16x + 8}$
$\boxed{x^3 - 14x + 8}$

6. $(5x+15)(2x+7)$
$10x^2 + 35x + 30x + 105$
$\boxed{10x^2 + 65x + 105}$

7. $(x+2)(x+2)(x+2)$
$(x+2)(x^2+4x+4)$
$x^3 + 4x^2 + 4x$
$\underline{\quad + 2x^2 + 8x + 8}$
$\boxed{x^3 + 6x^2 + 12x + 8}$

8. $15x + 25y$
$\boxed{5(3x+5y)}$

9. $12x^2 - 18x$
$\boxed{6x(2x-3)}$

10. $x^2 + 4x - 5$
$\boxed{(x+5)(x-1)}$

11. $x^2 - 7x - 8$
$\boxed{(x-8)(x+1)}$

12. $x^2 + 11x + 24$
$\boxed{(x+8)(x+3)}$

13. $x^2 - 13x + 12$
$\boxed{(x-12)(x-1)}$

14. $x^2 - 49$
$\boxed{(x-7)(x+7)}$

15. $5x^2 + 8x + 3$
$\boxed{(5x+3)(x+1)}$

16. $5x^2 + 15x + 10$
$5(x^2 + 3x + 2)$
$\boxed{5(x+2)(x+1)}$

17. $x^3 - 25x$
$x(x^2 - 25)$
$\boxed{x(x-5)(x+5)}$

18. $x^4 - 81$
$(x^2-9)(x^2+9)$
$\boxed{(x-3)(x+3)(x^2+9)}$

19. $x^4 - 5x^2 + 4$
$(x^2-1)(x^2-4)$
$\boxed{(x-1)(x+1)(x-2)(x+2)}$
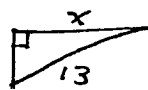
20. $(x-4)(x+2)=0$
$\boxed{x=4 \quad x=-2}$

21. $x^2 + 5x = 0$
$x(x+5) = 0$
$\boxed{x=0 \quad x=-5}$

22. $x^2 + 6 = 5x$
$\underline{\quad -5x \quad -5x}$
$x^2 - 5x + 6 = 0$
$(x-3)(x-2) = 0$
$\boxed{x=3 \quad x=2}$

23. $x(x+2) = 8$
$x^2 + 2x - 8 = 0$
$(x+4)(x-2) = 0$
$\boxed{x=-4 \quad x=2}$

24. a) Pythagoras
b) hypotenuse
c) $a^2 + b^2 = c^2$

25.
$5^2 + x^2 = 13^2$
$25 + x^2 = 169$
$x^2 = 144$
$x = \pm 12$
$\boxed{x = 12}$

26.
$6^2 + 8^2 = x^2$
$36 + 64 = x^2$
$100 = x^2$
$x = \pm 10$
$\boxed{x = 10}$

27.
$x^2 + 4^2 = 9^2$
$x^2 + 16 = 81$
$x^2 = 65$
$x = \pm\sqrt{65}$
$\boxed{x = \sqrt{65} \approx 8.06}$

28. $3x^0$
$3 \cdot 1$
$\boxed{3}$

29. $3x^{-1}$
$3 \cdot \frac{1}{x}$
$\boxed{\frac{3}{x}}$

30. $(3x)^{-1}$
$\boxed{\frac{1}{3x}}$

31. $(3x)^{-2}$
$\frac{1}{(3x)^2}$
$\boxed{\frac{1}{9x^2}}$

32. $x^5 \cdot x^2 = \boxed{x^7}$

33. $(x^5)^2 = \boxed{x^{10}}$

34. $\dfrac{x^{10}}{x^2} = \boxed{x^8}$

35. $\dfrac{12x^{-4}}{4x^{-6}} = 3x^{-4-(-6)}$
$= \boxed{3x^2}$

36. $\dfrac{x^{-4}}{x^6} = x^{-4-6}$
$= x^{-10} = \boxed{\frac{1}{x^{10}}}$

37. $\left(\frac{3}{5}\right)^{-2}$
$\left(\frac{5}{3}\right)^2 = \boxed{\frac{25}{9}}$

38. $(x^4 y^{-2})^3$
$= x^{12} y^{-6}$
$= \boxed{\frac{x^{12}}{y^6}}$

39. $(2x^3)^3$
$2^3 x^9$
$\boxed{8x^9}$

40. $65{,}000{,}000$
$\boxed{6.5 \times 10^7}$

41. 0.000425
$\boxed{4.25 \times 10^{-4}}$

42. $200{,}000 \times 8{,}000{,}000$
$\boxed{1.6 \times 10^{12}}$

43. $\dfrac{0.0003}{60{,}000} = \boxed{5 \times 10^{-9}}$