BASIC ALGEBRA EXAM 2 X* 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 - 6, multiply the expressions:

1. $(x - 3)(x - 8)$ **2. $(3x - 5)(3x + 4)$** **3. $(2x - 5)(2x + 5)$**

4. $(2x - 5)^2$ **5. $(x + 2)(3x + 8)$** **6. $(2x+5)(x^2 - 4x - 7)$**

In 7 – 9, express each number as a product of prime numbers.

7. 40 **8. 72** **9. 840**

In 10 - 23, factor completely.

10. $5x^2 + 35x$ **11. $12xy + 16x^2 + 4x$** **12. $x^2 + 5x + 4$**

13. $x^2 - 2x - 8$ **14. $x^2 - 13x + 36$** **15. $x^2 - 49$**

16. $8x^2 - 16x$ **17. $x^2 + 17x + 60$** **18. $4x^2 - 27x + 18$**

$(4x \quad)(x \quad)$

BASIC ALGEBRA EXAM 2 X* NAME _____

19. $4x^3 - 16x^2 + 16x$ **20.** $5x^2 - 125$ **21.** $x^4 - 81$

22. $ax + bx + ay + by$ **23.** $x^3 - 5x^2 - 25x + 125$

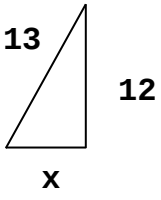
In 24 - 29, solve for x.

24. $(x-5)(x+2) = 0$ **25.** $x^2 + 7x = 0$ **26.** $x^2 + 7x = 8$

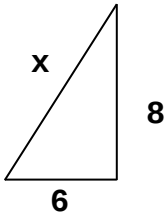
27. $x^2 - 10x + 25 = 0$ **28.** $x^2 - 8 = 2x$ **29.** $x^3 + 5x^2 + 6x = 0$

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

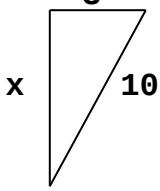
31. Find x:



32. Find x:



33. Find x:



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34. Find the diagonal of rectangle whose width is 5 and whose length is 12.

35. A guy wire to the top of a 50 foot pole reaches the ground 15 feet from the base of the pole. How long is the wire?

In 36 - 46, simplify using the laws of exponents. Eliminate all negative and zero exponents.

36. x^6x^3 **37.** $(x^6)^3$ **38.** $\frac{x^6}{x^3}$ **39.** $5x^0$

40. $5x^{-1}$ **41.** $5x^{-2}$ **42.** $\left(\frac{3}{4}\right)^{-2}$ **43.** $2^3\ 2^7$

44. $\frac{x^{-6}}{x^{-8}}$ **45.** $(x^2y^{-3})^{-2}$ **46.** $\left(5x^2\right)^{-3}$ **47.** $\frac{(6x^3)^2}{3x}$

In 48 - 51, express answers in scientific notation (any method!).

48. 930000 **49.** 0.000352

50. $\frac{0.0025}{5000}$ **51.** $\frac{7500000}{0.025}$

BASIC ALGEBRA EXAM 2X* Solutions

1. $(x-3)(x-8)$ → $x^2-11x+24$

2. $(3x-5)(3x+4)$ → $9x^2-3x-20$

3. $(2x-5)(2x+5)$ → $4x^2-25$

4. $(2x-5)(2x-5)$ → $4x^2-20x+25$

5. $(x+2)(3x+8)$ → $3x^2+14x+16$

6. $(2x+5)(x^2-4x-7)$

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

$+5x^2-20x-35$

$2x^3-3x^2-34x-35$

7. 40 → $8 \cdot 5$, $2 \cdot 4$, $2 \cdot 2 \cdot 2$ → $40 = 2^3 \cdot 5$

8. 72 → $8 \cdot 9$, $2 \cdot 4 \cdot 3 \cdot 3$, $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$ → $72 = 2^3 \cdot 3^2$

9. 840 → $10 \cdot 84$, $2 \cdot 5 \cdot 4 \cdot 21$, $2 \cdot 2 \cdot 2 \cdot 3 \cdot 7$ → $840 = 2^3 \cdot 3 \cdot 5 \cdot 7$

10. $5x^2+35x = 5x(x+7)$

11. $12xy+16x^2+4x$

$4x(3y+4x+1)$

12. x^2+5x+4

$(x+4)(x+1)$

13. x^2-2x-8

$(x-4)(x+2)$

14. $x^2-13x+36$

$(x-9)(x-4)$

15. x^2-49

$(x-7)(x+7)$

16. $8x^2-16x$

$8x(x-2)$

17. $x^2+17x+60$

$(x+5)(x+12)$

18. $4x^2-27x+18$

$(4x-3)(x-6)$

19. $4x^3-16x^2+16x$

$4x(x^2-4x+4)$

$4x(x-2)(x-2)$

$4x(x-2)^2$

20. $5x^2-125$

$5(x^2-25)$

$5(x-5)(x+5)$

21. x^4-81

$(x^2-9)(x^2+9)$

$(x-3)(x+3)(x^2+9)$

22. $ax+bx+ay+by$

$x(a+b)+y(a+b)$

$(a+b)(x+y)$

23. $x^3-5x^2-25x+125$

$x^2(x-5)-25(x-5)$

$(x-5)(x^2-25)$

$(x-5)(x-5)(x+5)$

$(x-5)^2(x+5)$

24. $(x-5)(x+2)=0$

$x=5 \quad x=-2$

25. $x^2+7x=0$

$x(x+7)=0$

$x=0 \quad x=-7$

26. $x^2+7x=8$

$-8 \quad -8$

$x^2+7x-8=0$

$(x+8)(x-1)=0$

$x=-8 \quad x=1$

27. $x^2-10x+25=0$

$(x-5)(x-5)=0$

$x=5 \quad x=5$

or $x=5$

28. $x^2-8=2x$

$-2x \quad -2x$

$x^2-2x-8=0$

$(x-4)(x+2)=0$

$x=4 \quad x=-2$

29. $x^3+5x^2+6x=0$

$x(x^2+5x+6)=0$

$x(x+3)(x+2)=0$

$x=0 \quad x=-3 \quad x=-2$

30. Pythagoras

hypotenuse

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

31. $x^2+12^2=13^2$

$x^2+144=169$

$x^2=25$

$x=\pm 5$

$x=5$

32. $6^2+8^2=x^2$

$36+64=x^2$

$100=x^2$

$x^2=100$

$x=\pm 10$

$x=10$

33. $x^2+3^2=10^2$

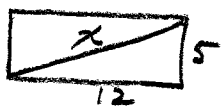
$x^2+9=100$

$x^2=91$

$x=\pm\sqrt{91}$

$x=\sqrt{91}$

$x \approx 9.54$

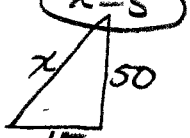
34. 

$12^2+5^2=x^2$

$144+25=x^2$

$x^2=169$

$x=13$

35. 

$15^2+50^2=x^2$

$225+2500=x^2$

$x^2=2725$

$x=\sqrt{2725} \approx 52.20$

36. $x^6 \cdot x^3 = x^9$

37. $(x^6)^3 = x^{18}$

38. $\frac{x^6}{x^3} = x^3$

39. $5x^0 = 5 \cdot 1 = 5$

40. $5x^{-1} = \frac{5}{x}$

41. $5x^{-2} = 5 \cdot \frac{1}{x^2} = \frac{5}{x^2}$

42. $\left(\frac{3}{4}\right)^{-2} = \left(\frac{4}{3}\right)^2 = \frac{16}{9}$

43. $2^3 \cdot 2^7 = 2^{10}$ or 1024

44. $\frac{x^{-6}}{x^{-8}} = x^{-6+8} = x^2$

45. $\left(x^2y^{-3}\right)^{-2}$

$= x^{-4}y^6$

$= \frac{1}{x^4}y^6 = \frac{y^6}{x^4}$

46. $\left(5x^2\right)^{-3}$

$= \frac{1}{(5x^2)^3}$

$= \frac{1}{125x^6}$

47. $\frac{(6x^3)^2}{3x}$

$= \frac{36x^6}{3x^1}$

$= 12x^5$

48. 93000

9.3×10^5

49. 0.000352

3.52×10^{-4}

50. $\frac{0.0025}{5000}$

5×10^{-7} calculator!

51. $\frac{7500100}{0.025}$

3×10^8 calculator!