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

1. $4x(2x + 7)$ **2. $(x + 4)(x - 6)$** **3. $(x - 13)(x - 2)$**

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

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

7. 24 **8. 60** **9. 540**

In 10 - 23, factor completely.

10. $x^2 + 8x$ **11. $24x^3 - 16x^2$** **12. $x^2 + 6x + 8$**

13. $x^2 + 7x - 18$ **14. $x^2 - 36$** **15. $x^2 - 14x + 49$**

16. $x^2 - 11x + 30$ **17. $x^3 - 5x^2 - 24x$** **18. $x^4 - 81$**

19. $ax + ay - bx - by$

20. $x^3 - 3x^2 - 4x + 12$

21. $3x^2 - 18x + 27$

22. $3x^2 + 23x + 14$

23. $3x^2 + 13x + 14$

In 24 - 29, solve for x.

24. $(x + 5)(x - 3) = 0$

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

26. $x^2 - 6x = 16$

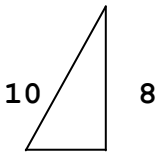
27. $x(x + 5) = 6$

28. $x^2 = 4(3 - x)$

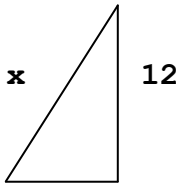
29. $x^3 - 25x = 0$

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

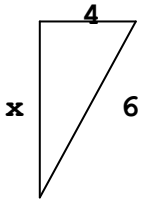
31. **Find x:**



32. **Find x:**



33. **Find x:**



In 34 - 46, simplify using the laws of exponents. Eliminate all negative and zero exponents.

34. $5x^0$

35. $(5x)^0$

36. $5x^{-1}$

37. $(5x)^{-1}$

38. $(5x)^{-2}$

39. $x^{10}\,x^2$

40. $(3x^4)^2$

41. $\dfrac{24x^2}{6x^6}$

42. $\dfrac{x^6}{x^{-2}}$

43. $\left(\dfrac{3}{5}\right)^{-2}$

44. $\dfrac{(x^3)^4 x^6}{x^2}$

45. $\left(2x^{-2}y^4\right)^3$

In 46 - 50, express answers in scientific notation (use method of your choice).

46. 0.0000348

47. 348,000,000

48. 7,500,000 • 40,000,000

49. $\dfrac{0.0000492}{296,000}$

50. 0.000042 • 0.0003

BASIC ALGEBRA EXAM 2 C* Solutions

1. $4x(2x+7)$ → $8x^2+28x$

2. $(x+4)(x-6)$ → $x^2-2x-24$

3. $(x-13)(x-2)$ → $x^2-15x+26$

4. $(2x+3)(x+5)$ → $2x^2+13x+15$

5. $(2x-3)^2$ → $4x^2-12x+9$

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

x^3-4x^2+5x

$3x^2-12x+15$

$x^3-x^2-7x+15$

7. 24 → 6, 4 → 2, 3, 2, 2 → $2^3 \cdot 3$

8. 60 → 6, 10 → 2, 3, 2, 5 → $2^2 \cdot 3 \cdot 5$

9. 540 → 10, 54 → 2, 5, 6, 9 → 2, 3, 3, 3 → $2^2 \cdot 3^3 \cdot 5$

10. x^2+8x → $x(x+8)$

11. $24x^3-16x^2$ → $8x^2(3x-2)$

12. x^2+6x+8 → $(x+4)(x+2)$

13. $x^2+7x-18$ → $(x+9)(x-2)$

14. x^2-36 → $(x-6)(x+6)$

15. $x^2-14x+49$ → $(x-7)(x-7)$ → $(x-7)^2$

16. $x^2-11x+30$ → $(x-6)(x-5)$

17. x^3-5x^2-24x

$x(x^2-5x-24)$

$x(x-8)(x+3)$

18. x^4-81

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

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

19. $ax+ay-bx-by$

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

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

20. $x^3-3x^2-4x+12$

$x^2(x-3)-4(x-3)$

$(x-3)(x^2-4)$

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

21. $3x^2-18x+27$

$3(x^2-6x+9)$

$3(x-3)(x-3)$

$3(x-3)^2$

22. $3x^2+23x+14$ → $(3x+2)(x+7)$

23. $3x^2+13x+14$ → $(3x+7)(x+2)$

24. $(x+5)(x-3)=0$ → $x=-5$ $x=3$

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

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

$x=4$ $x=-2$

26. $x^2-6x=16$

$x^2-6x-16=0$

$(x-8)(x+2)=0$

$x=8$, $x=-2$

27. $x(x+5)=6$

$x^2+5x-6=0$

$(x+6)(x-1)=0$

$x=-6$ $x=1$

28. $x^2=4(3-x)$

$x^2=12-4x$

$x^2+4x-12=0$

$(x+6)(x-2)=0$

$x=-6$ $x=2$

29. $x^3-25x=0$

$x(x^2-25)=0$

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

$x=0$ $x=5$ $x=-5$

30. Pythagoras, Hypotenuse

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

31. $x^2+8^2=10^2$

$x^2+64=100$

$x^2=36$

$x=\pm 6$ → $x=6$

32. $5^2+12^2=x^2$

$25+144=x^2$

$169=x^2$

$x=\pm 13$ → $x=13$

33. $x^2+4^2=6^2$

$x^2+16=36$

$x^2=20$

$x=\pm\sqrt{20}$ → $x=\sqrt{20}$ or $x\approx 4.47$

34. $5x^0$

35. $(5x)^0=1$

5.1

5

36. $5x^{-1}=\frac{5}{x}$

37. $(5x)^{-1}=\frac{1}{5x}$

38. $(5x)^{-2}=\frac{1}{(5x)^2}=\frac{1}{25x^2}$

39. $x^{10} \cdot x^2 = x^{12}$

40. $(3x^4)^2 = 9x^8$

41. $\frac{24x^2}{6x^6} = \frac{4}{x^4}$

42. $\frac{x^6}{x^{-2}} = x^{6-(-2)} = x^8$

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

44. $\frac{(x^3)^4 \cdot x^6}{x^2} = \frac{x^{12} \cdot x^6}{x^2} = \frac{x^{18}}{x^2} = x^{16}$

45. $(2x^{-3}y^4)^3 = 8x^{-9}y^{12}$

$= 8 \cdot \frac{1}{x^9} y^{12}$

$= \frac{8y^{12}}{x^9}$

46. 3.48×10^{-5}

47. 3.48×10^{8}

48. 3×10^{14}

49. 1.66×10^{10}

50. 1.36×10^{-9}