

# EXIT EXAM HOMEWORK 1

Name \_\_\_\_\_

You must show all steps. Check and correct before turning in.

Use the law to give equivalent expressions.

Commutative – Changing the order of addition or multiplication does not affect the answer.

1.  $4 + 5 =$  \_\_\_\_\_

2.  $XY =$  \_\_\_\_\_

Associative – Numbers can be grouped in any manner for addition or multiplication.

3.  $(A + 2) + 5 =$  \_\_\_\_\_

4.  $5(XY) =$  \_\_\_\_\_

Distributive – The product of a number and a sum can be written as the sum of two products.

5.  $7(X + Y) =$  \_\_\_\_\_

## ORDER OF OPERATIONS

- Get one number inside Parentheses or other grouping symbols ( ( ), [ ], --, | | working from the inside to the outside if necessary.
- Evaluate Exponents.
- Multiply and/or Divide from Left to Right.
- Add and/or Subtract from Left to Right.

6.  $50 - 2 \cdot 5^2$

7.  $7 + 5(3 + 2)$

8.  $12 - 16 \div 4 \cdot 4$

9.  $8(-2) - (-6) \div 3$

10.  $10 - (4 - 9)^2$

11.  $-3^4 + (-4)^3$

12.  $\frac{-5(-3)}{-8-7}$

13.  $\frac{5^2}{2 \cdot 6 - 12}$

14.  $|-6| + |6|$

15.  $|23| - |-18| - |-12|$

16. Evaluate  $30 \div 6x$  for  $x = 5$

17. Evaluate  $x^2 - 3x + 5$  for  $x = -4$

18. Evaluate  $(xy)^2 - (x + y)^2$  for  $x = 3$  and  $y = 4$

19. Bowlers who average under 200 often have handicaps added to their score. The handicap  $H$  of a bowler whose average score is  $A$  is often determined by  $H = .8(200 - A)$ . What is the handicap of a person whose average score is 150?

20. In the exponential expression  $3x^4$ , find the base, exponent, and coefficient.

21. When adding or subtracting monomials, add or subtract only the coefficients of like terms.

(a)  $6x + 4x$

(b)  $3x^2 + 7x^2$

(c)  $9x - 7x$

(d)  $5x - 2y$

22. When multiplying monomials, multiply coefficients and add exponents of like bases.

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

(b)  $(2x)(3x^2y)$

(c)  $(2x^5y)(6x^3y^7)$

(d)  $(6x^3)(-5x^3)$

23. When raising a monomial to a power, raise the coefficient to the power and multiply the exponents.

(a)  $(3x^3)^3$

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

(c)  $\left(\frac{5x}{y^4}\right)^2$

24. When dividing monomials reduce the coefficients and subtract exponents of like bases (put where the largest exponent was).

(a)  $\frac{x^3}{x^2}$

(b)  $\frac{6x^6}{2x^2}$

(c)  $\frac{x^5}{x^5}$

(d)  $\frac{x^3}{x^5}$

(e)  $\frac{6x^2y^5}{9xy^7}$

25. For any nonzero real number  $a$ ,  $a^0 = 1$

(a)  $4^0$

(b)  $x^0$

(c)  $3x^0$

(d)  $(5x)^0$

26. For any nonzero real number  $a$  and any integer  $n$ ,  $a^{-n} = \frac{1}{a^n}$

For any nonzero real number  $a$  and any integer  $n$ ,  $\frac{1}{a^{-n}} = a^n$

(a)  $3^{-2}$

(b)  $x^{-4}$

(c)  $3x^{-3}$

(d)  $\frac{1}{x^{-5}}$

(e)  $\frac{x^3}{2y^{-1}}$

27. Mixed Practice. Leave only positive exponents in your answer.

a.  $(2x)^3(3x^5)$

b.  $\frac{(3x^3)^2}{9x^5}$

c.  $5x^0y^{-3}$

d.  $\left(\frac{4x^3}{y}\right)^2$

e.  $(5x^{-1})3^3$

f.  $\frac{20x^{-4}y}{15x^2y}$

g.  $(4x^2)^3 + x x^2 x^7$

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

i.  $\frac{12x^{-3}y^2}{36x^3y^{-3}}$

28. To add polynomials just combine like terms.

a.  $(7x^3 + 3x^2 - x) + (2x^2 - x + 6)$

b.  $(5x^2 + xy + 7y^2) + (3x^2y^2 + 4xy + y^2)$

29. To subtract polynomials add the opposite polynomial and combine like terms.

a.  $(6x - y) - (-4x + 7y)$

b.  $(x^2 - 3x) - (2x^2 + 4x - 8)$

30. To multiply polynomials multiply by distributing and if necessary combine like terms.

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

b.  $(x - 5y)(x + 5y)$

c.  $(x + m)^2$

d.  $(x + 4)(3x^2 + 2x + 1)$

e.  $(2x^5 - 1)(x^4 + 3)$

### STRATEGY FOR FACTORING COMPLETELY

- A. Always look for the greatest common factor first !! Ask: Can I take anything out?
- B. 2 TERMS - It will not factor further unless it is the difference of squares.
- C. 3 TERMS - choose method based on leading coefficient
- D. 4 TERMS – grouping
- E. Check to see if you can factor again

31. Factor completely

a.  $4x + 2$

b.  $x^4 - 16$

c.  $x^2 + 5x - 36$

d.  $3x^2 - 11x + 10$

e.  $ax + 2mx + ay + 2my$

f.  $5x^3y - 45xy^3$

g.  $2x^2 - 8x - 10$

h.  $8x^2 - 14xy + 5y^2$

32. Identify a factor of the trinomial  $3x^2 - 13x - 30$ .

a.  $(3x - 6)$

b.  $(x - 6)$

c.  $(x + 5)$

d.  $(3x + 10)$

Answers to Review for Final HOMEWORK1

1.  $5 + 4$

2.  $YX$

3.  $A + (2 + 5)$

4.  $(5X)Y$

5.  $7X + 7Y$

6.  $0$

7.  $32$

8.  $-4$

9.  $-14$

10.  $-15$

11.  $-145$

12.  $-1$

13. undefined

14.  $12$

15.  $-7$

16.  $25$

17.  $33$

18.  $95$

19.  $40$

20.  $x, 4, 3$

21. a  $10x$

b  $10x^2$

c  $2x$

d will not simplify

22. a  $12x^3$

b  $6x^3y$

c  $12x^8y^8$

d  $-30x^6$

23. a  $27x^9$

b  $16x^{12}y^4$

c  $\frac{25x^2}{y^8}$

24. a  $x$

b  $3x^4$

c  $1$

d  $\frac{1}{x^2}$

e  $\frac{2x}{3y^2}$

25. a  $1$

b  $1$

c  $3$

d  $1$

26. a  $\frac{1}{9}$   
 b  $\frac{1}{x^4}$   
 c  $\frac{3}{x^3}$   
 d  $x^5$   
 e  $\frac{x^3y}{2}$
27. a  $24x^8$   
 b  $x$   
 c  $\frac{5}{y^3}$   
 d  $\frac{16x^6}{y^2}$   
 e  $\frac{135}{x}$   
 f  $\frac{4}{3x^6}$   
 g  $64x^6 + x^{10}$   
 h  $10x^6 + 81x^8$   
 i  $\frac{y^5}{3x^6}$
28. a  $7x^3 + 5x^2 - 2x + 6$   
 b  $5x^2 + 5xy + 8y^2 + 3x^2y^2$
29. a  $10x - 8y$   
 b  $-x^2 - 7x + 8$
30. a  $-6x^7 + 3x^5 - 12x^2$   
 b  $x^2 - 25y^2$   
 c  $x^2 + 2xm + m^2$   
 d  $3x^3 + 14x^2 + 9x + 4$   
 e  $2x^9 + 6x^5 - x^4 - 3$
31. a  $2(2x + 1)$   
 b  $(x^2 + 4)(x + 2)(x - 2)$   
 c  $(x + 9)(x - 4)$   
 d  $(3x - 5)(x - 2)$   
 e  $(a + 2m)(x + y)$   
 f  $5xy(x + 3y)(x - 3y)$   
 g  $2(x + 1)(x - 5)$   
 h  $(2x - y)(4x - 5y)$
32. b