

Name SOLUTIONS

Each of the 18 questions is worth 5 points plus 1 points for each of 10 homework problems for a total of 100

Simplify the expression so that no negative exponents appear in the final result. Assume all variables represent nonzero numbers.

1) $(5x^{-4})^2(x^3)^{-4}$

$$5^2 x^{-8} x^{-12}$$
$$25 x^{-20}$$

$$\frac{25}{x^{20}} \quad \text{OR} \quad \frac{5^2}{x^{20}}$$

Express the number in scientific notation.

2) 0.0000042214

$$4.2214 \times 10^{-6}$$

Add or subtract as indicated.

3) $(5n^5 - 5n - 6n^4) + (2n^4 + 7n^5 - 7n)$

$$\begin{array}{r} 5n^5 - 6n^4 - 5n \\ + 7n^5 + 2n^4 - 7n \\ \hline \end{array}$$

$$12n^5 - 4n^4 - 12n$$

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

$$\begin{array}{r} 4x^8 + 8x^7 + 7x^6 - 4 \\ - 8x^8 - 3x^7 - 5x^6 - 8 \\ \hline \end{array}$$

$$\boxed{-4x^8 + 5x^7 + 2x^6 - 12}$$

Find the product.

5) $(p + 6q)(p - 6q)$

$$\boxed{p^2 - 36q^2}$$

SUM & DIF OF SAME
TWO VALUES

6) $(5y - 6)(25y^2 + 30y + 36)$

$$\begin{array}{r} 25y^2 + 30y + 36 \\ \times \quad \quad \quad 5y - 6 \\ \hline -150y^2 - 180y - 216 \\ 125y^3 + 150y^2 + 180y \\ \hline \end{array}$$

$$\boxed{125y^3 - 216}$$

Divide.

$$7) \frac{x^2 + 7x + 10}{x + 2}$$

$$\begin{array}{r}
 x + 2 \overline{) x^2 + 7x + 10} \\
 \underline{-(x^2 + 2x)} \\
 5x + 10 \\
 \underline{-(5x + 10)} \\
 0 \text{ REMAINDER}
 \end{array}$$

$$\boxed{x + 5}$$

$$8) \frac{-9x^3 - 15x^2 - 16x - 4}{-3x - 1}$$

1st MULT. NUM.
 $\frac{1}{-1}$ DENOM. BY -1

$$\begin{array}{r}
 3x + 1 \overline{) 9x^3 + 15x^2 + 16x + 4} \\
 \underline{-(9x^3 + 3x^2)} \\
 12x^2 + 16x + 4 \\
 \underline{-(12x^2 + 4x)} \\
 12x + 4 \\
 \underline{-(12x + 4)} \\
 0 \text{ REMAINDER}
 \end{array}$$

$$\boxed{3x^2 + 4x + 4}$$

Factor out the greatest common factor. Simplify the factors, if possible.

$$9) 36x^8y^9 + 30x^3y^7 + 42x^6y^4$$

$$\boxed{6x^3y^4 (6x^5y^5 + 5y^3 + 7x^3)}$$

Factor by grouping.

10) $s^2 + 4s + 3s + 12$

$$s(s+4) + 3(s+4)$$

$$\boxed{(s+3)(s+4)}$$

Factor the trinomial completely.

11) $x^2 - x - 90$

$$\boxed{(x-10)(x+9)}$$

12) $9x^2 - 27xy - 36y^2$

$$9(x^2 - 3xy - 4y^2)$$

$$\boxed{9(x-4y)(x+y)}$$

Factor the polynomial.

13) $36x^2 - 84xy + 49y^2$

$$(6x)^2 - 84xy + (7y)^2$$

$2 \cdot 6x \cdot 7y = 84xy$ SO THIS IS A PERFECT SQUARE.

$$(6x - 7y)^2$$

Factor the polynomial completely.

14) $27a^3 - 64b^3$

$(3a)^3 - (4b)^3$ DIF. OF TWO CUBES

$$(3a - 4b)((3a)^2 + (3a)(4b) + (4b)^2)$$

$$(3a - 4b)(9a^2 + 12ab + 16b^2)$$

15) $12x^2 + 17x + 6$

PRODUCT = $6 \cdot 12 = 72$ SUM = 17

NUMBERS ARE 8 & 9

$$12x^2 + 8x + 9x + 6$$

$$4x(3x+2) + 3(3x+2)$$

$$(4x+3)(3x+2)$$

16) $10a^3 + 6a^2b - 15ab^2 - 9b^3$

$$2a^2(sa + 3b) - 3b^2(sa + 3b)$$

GROUPING

$$(2a^2 - 3b^2)(sa + 3b)$$

Solve the equation.

17) $(x + 6)(x - 3)(x - 12) = 0$

$$x + 6 = 0 \quad \text{OR} \quad x - 3 = 0 \quad \text{OR} \quad x - 12 = 0$$

$$x = -6, 3, \text{ or } 12$$

Find all solutions by factoring.

18) $2x^2 + 24 = x^2 + 11x$

$$2x^2 - x^2 - 11x + 24 = 0$$

$$x^2 - 11x + 24 = 0$$

$$(x - 8)(x - 3) = 0$$

$$x - 8 = 0 \quad \text{OR} \quad x - 3 = 0$$

$$x = 3, \text{ or } 8$$