

WS Chapter 7B Test Review

Factor the common factor out of each expression.

$$1) \frac{-63x^2}{-9} + \frac{54x}{-9} - \frac{9}{-9}$$

$$\boxed{-9(7x^2 + 6x - 1)}$$

$$\begin{array}{r} 63 \\ 1 \overline{) 63} \\ 3 \overline{) 21} \\ 7 \overline{) 9} \end{array} \quad \begin{array}{r} 54 \\ 1 \overline{) 54} \\ 2 \overline{) 27} \\ 3 \overline{) 18} \\ 6 \overline{) 9} \end{array}$$

$$2) \frac{-8x^8}{-4x} - \frac{12x^2}{-4x} + \frac{36x}{-4x}$$

$$\boxed{-4x(2x^7 + 3x - 9)}$$

$$\begin{array}{r} 8 \\ 1 \overline{) 8} \\ 2 \overline{) 4} \end{array} \quad \begin{array}{r} 12 \\ 1 \overline{) 12} \\ 2 \overline{) 6} \\ 3 \overline{) 4} \end{array}$$

$$\begin{array}{r} 9 \\ 1 \overline{) 9} \\ 3 \overline{) 3} \end{array}$$

$$\begin{array}{r} 36 \\ 1 \overline{) 36} \\ 2 \overline{) 18} \\ 3 \overline{) 12} \\ 4 \overline{) 9} \\ 6 \overline{) 6} \end{array}$$

Factor each completely.

$$3) \frac{21a^3}{3a^2} - \frac{24a^2}{3a^2} + \frac{14a}{2} - \frac{16}{2}$$

$$3a^2(7a - 8) + 2(7a - 8)$$

$$\boxed{(3a^2 + 2)(7a - 8)}$$

$$4) \frac{56x^3}{7x^2} - \frac{49x^2}{7x^2} + \frac{40x}{5} - \frac{35}{5}$$

$$7x^2(8x - 7) + 5(8x - 7)$$

$$\boxed{(7x^2 + 5)(8x - 7)}$$

$$5) \frac{3k^2}{3} - \frac{6k}{3} - \frac{9}{3}$$

$$3(k^2 - 2k - 3)$$

$$\begin{array}{r} -3 \\ 1 \overline{) -3} = -2 \end{array}$$

$$3\left(\frac{k^2}{k} + \frac{k}{k} - \frac{3k}{-3} - \frac{3}{-3}\right)$$

$$3(k(k+1) - 3(k+1))$$

$$\boxed{3(k-3)(k+1)}$$

$$6) \frac{x^2}{x} - \frac{x}{x}$$

$$\boxed{x(x-1)}$$

$$7) \frac{8n^2}{4n} - \frac{12n}{4n}$$

$$\boxed{4n(2n-3)}$$

$$8) \frac{18n^2}{6n} + \frac{12n}{6n}$$

$$\boxed{6n(3n+2)}$$

$$9) \frac{8n^2}{2} - \frac{66n}{2} + \frac{70}{2}$$

$$2(4n^2 - 33n + 35) \quad \begin{array}{r} 140 \\ -2 \overline{) 70} \\ -5 \overline{) 28} \end{array} = -33$$

$$2\left(\frac{4n^2}{n} - \frac{5n}{n} - \frac{28n}{-7} + \frac{35}{-7}\right)$$

$$2(n(4n-5) - 7(4n-5))$$

$$\boxed{2(n-7)(4n-5)}$$

$$11) 9x^2 - 1$$

$$(3x)^2 - (1)^2$$

$$\boxed{(3x+1)(3x-1)}$$

$$10) 4n^2 - 25n + 36$$

$$\frac{4n^2 - 9n - 16n + 36}{n \quad n \quad -4 \quad -4} \quad \begin{array}{r} 144 \\ -2 \overline{) 72} \\ -3 \overline{) 18} \\ -9 \overline{) 16} \end{array} = -25$$

$$n(4n-9) - 4(4n-9)$$

$$\boxed{(n-4)(4n-9)}$$

$$12) 16n^2 - 25$$

$$(4n)^2 - (5)^2$$

$$\boxed{(4n+5)(4n-5)}$$

Solve each equation by factoring.

$$13) (2n+1)(n-8) = 0$$

$$\frac{2n+1}{1 \quad -1} = 0$$

$$\frac{2n}{2} = \frac{-1}{2}$$

$$\boxed{n = -\frac{1}{2}}$$

$$\frac{n-8}{+8 \quad +8} = 0$$

$$\boxed{n=8}$$

$$14) (5v+7)(v-8) = 0$$

$$\frac{5v+7}{-7 \quad -7} = 0$$

$$\frac{5v}{5} = \frac{-7}{5}$$

$$\boxed{v = -\frac{7}{5}}$$

$$\frac{v-8}{+8 \quad +8} = 0$$

$$\boxed{v=8}$$

$$15) \frac{n^2}{n} + \frac{6n}{n} = 0$$

$$n(n+6) = 0$$

$$\boxed{n=0}$$

$$\frac{n+6}{-6 \quad -6} = 0$$

$$\boxed{n=-6}$$

$$17) 5p^2 - 23p + 12 = 0$$

$$\frac{5p^2}{p} - \frac{3p}{p} - \frac{20p}{-4} + \frac{12}{-4} = 0$$

$$p(5p-3) - 4(5p-3) = 0$$

$$(p-4)(5p-3) = 0$$

$$\frac{p-4}{+4 \quad +4} = 0$$

$$\boxed{p=4}$$

$$\frac{5p-3}{+8 \quad +3} = 0$$

$$\frac{5p}{5} = \frac{3}{5}$$

$$\boxed{p = \frac{3}{5}}$$

$$\frac{60}{-1 \quad -60} = -23$$

$$16) x^2 + 9x + 14 = 0$$

$$\frac{x^2}{x} + \frac{2x}{x} + \frac{7x}{7} + \frac{14}{7} = 0$$

$$x(x+2) + 7(x+2) = 0$$

$$(x+7)(x+2) = 0$$

$$\frac{x+7}{-7 \quad -7} = 0$$

$$\boxed{x=-7}$$

$$\frac{x+2}{+2 \quad -2} = 0$$

$$\boxed{x=-2}$$

$$\frac{14}{1 \quad 14} = 9$$

$$18) 5a^2 - 11a + 6 = 0$$

$$\frac{5a^2}{5a} - \frac{5a}{5a} - \frac{6a}{-6} + \frac{6}{-6} = 0$$

$$5a(a-1) - 6(a-1) = 0$$

$$(5a-6)(a-1) = 0$$

$$\frac{5a-6}{+6 \quad +6} = 0$$

$$\frac{5a}{5} = \frac{6}{5}$$

$$\boxed{a = \frac{6}{5}}$$

$$\frac{a-1}{+1 \quad +1} = 0$$

$$\boxed{a=1}$$

$$\frac{30}{-1 \quad -30} = -11$$

19) Find all the factors of the polynomial. Select all that apply.

$$3x^2 + 30x - 4 = 4x + 5$$

a) $x+9$

b) $3x-1$

c) $x-9$

d) $3x+1$

e) $x+27$

f) $x-1$

$$3x^2 + 26x - 9 = 0$$

$$\frac{3x^2}{x} - \frac{x}{x} + \frac{27x}{9} - \frac{9}{9} = 0$$

$$x(3x-1) + 9(3x-1) = 0$$

$$(x+9)(3x-1) = 0$$

$$\frac{-27}{-1 \quad 27} = 26$$

- 20) The area of a rectangle is $2x^2 - 5x + 3$. Find an expression for the length and an expression for the width of the rectangle. $A = l \cdot w$

$$\begin{array}{r} 6 \\ -2 \overline{) -3} \\ \underline{-4} \\ -5 \end{array}$$

$$2x^2 - 5x + 3$$

$$\frac{2x^2 - 2x - 3x + 3}{2x \quad 2x \quad -3 \quad -3}$$

$$2x(x-1) - 3(x-1)$$

$$\boxed{(2x-3)(x-1)} \text{ units}^2$$

- 21) The volume of a cereal box is 48 cubic feet. The height of the cereal box is 2 feet, the width is x and the length is $x + 2$. Find x . $V = l \cdot w \cdot h$

$$2x(x+2) = 48$$

$$2x^2 + 4x = 48$$

$$\begin{array}{r} 2x^2 + 4x = 48 \\ -18 \quad -18 \\ \hline 2x^2 + 4x - 48 = 0 \end{array}$$

$$2(x^2 + 2x - 24) = 0$$

$$\begin{array}{r} -24 \\ -4 \overline{) 6} \\ \underline{-8} \\ 2 \end{array}$$

$$2\left(\frac{x^2 - 4x + 6x - 24}{x \quad x \quad 6 \quad 6}\right) = 0$$

$$2(x(x-4) + 6(x-4)) = 0$$

$$2(x+6)(x-4) = 0$$

$$\boxed{x=4} \text{ in.}$$

$$\begin{array}{r} x+6=0 \\ -6 \quad -6 \\ \hline x=-6 \end{array}$$

$$\begin{array}{r} x-4=0 \\ +4 \quad +4 \\ \hline x=4 \end{array}$$

* can't have negative feet

- 22) The area of a rectangle is represented by the expression $2x^4 - 12x^3 + 22x^2$. If the length of the rectangle is $2x^2$, what is an expression for the width of the rectangle?

$$\frac{A}{l} = \frac{l \cdot w}{l}$$

$$\frac{A}{l} = w$$

$$w = \frac{2x^4 - 12x^3 + 22x^2}{2x^2}$$

$$= \frac{2x^4}{2x^2} - \frac{12x^3}{2x^2} + \frac{22x^2}{2x^2}$$

$$\boxed{w = x^2 - 6x + 11} \text{ units}$$

- 23) The volume of a cube is 96 cubic inches. The height of the cube is 4 inches, the width is $x - 1$ inches and the length is $x + 4$ inches. Find x . (Volume = lwh)

$$4(x-1)(x+4) = 96$$

$$(4x-4)(x+4) = 96$$

$$4x^2 + 16x - 4x - 16 = 96$$

$$\frac{4x^2 + 12x - 112}{4 \quad 4 \quad 4} = 0$$

$$4(x^2 + 3x - 28) = 0$$

$$\begin{array}{r} -28 \\ -4 \overline{) 7} \\ \underline{-28} \\ 0 \end{array}$$

$$4\left(\frac{x^2 - 4x + 7x - 28}{x \quad x \quad 7 \quad 7}\right) = 0$$

$$4(x(x-4) + 7(x-4)) = 0$$

$$4(x+7)(x-4) = 0$$

$$\begin{array}{r} x+7=0 \\ -7 \quad -7 \\ \hline x=-7 \end{array}$$

$$\begin{array}{r} x-4=0 \\ +4 \quad +4 \\ \hline x=4 \end{array}$$

$$\boxed{x=4} \text{ in.}$$