

HOMEWORK #1

SECTION 1.6

SECTION 1.4

#55 Evaluate $x^2 - x$ for the value of x satisfying

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

Solution

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

$$4x - 8 + 2 = 4x - 4 + 2x$$

$$4x - 6 = 6x - 4$$

$$-6 + 4 = 6x - 4x$$

$$-2 = 2x \rightarrow x = -1$$

Then for, $x^2 - x = (-1)^2 - (-1)$
 $= 1 + 1 = 2$

#58 Evaluate $x^2 - (xy - y)$ for x satisfying $\frac{13x-6}{4} = 5x+2$

and y satisfying $5-y = 7(y+4)+1$

Solution

$x = ?$ $\frac{13x-6}{4} = 5x+2$

$$13x-6 = 4(5x+2)$$

$$13x-6 = 20x+8$$

$$-6-8 = 20x-13x$$

$$-14 = 7x \rightarrow x = -2$$

$y = ?$ $5-y = 7(y+4)+1$

$$5-y = 7y+28+1$$

$$5-y = 7y+29$$

$$5-29 = 7y+y$$

$$-24 = 8y \Rightarrow y = -3$$

$$x^2 - (xy - y) = (-2)^2 - ((-2)(-3) - (-3))$$

$$= 4 - (6+3)$$

$$= 4 - 9$$

$$= -5$$

#119 $\left(\frac{3x^4}{y^{-4}}\right)^{-1} \left(\frac{2x}{y^2}\right)^3 =$

$$= \frac{3^{-1} x^{-4}}{y^4} \cdot \frac{2^3 x^3}{y^6}$$

$$= \frac{8}{3} \cdot \frac{x^{-4+3}}{y^{4+6}} = \frac{8x^{-1}}{3y^{10}} = \boxed{\frac{8}{3xy^{10}}}$$

#121 $(-4x^3y^{-5})^{-2} (2x^{-8}y^{-5}) =$

$$= (-4)^{-2} x^{-6} y^{10} 2x^{-8} y^{-5}$$

$$= \frac{2}{(-4)^2} x^{-6-8} y^{10-5} = \frac{2}{16} x^{-14} y^5 = \boxed{\frac{y^5}{8x^{14}}}$$

#123 $(2x^2y^4)^{-1} (4xy^3)^{-3} =$

$$= \frac{(2x^2y^4)^{-1} (4xy^3)^{-3}}{(x^2y)^5 (x^3y^2)^4} =$$

$$= \frac{2^{-1} x^{-2} y^{-4} (4)^{-3} x^{-3} y^{-9}}{x^{-10} y^{-5} x^{12} y^8} = \frac{2^{-1} 4^{-3} x^{-2-3} y^{-4-9}}{x^{-10+12} y^{-5+8}} = \frac{2 \cdot 4^{-3} x^{-5} y^{-13}}{x^2 y^3}$$

$$= \frac{1}{2 \cdot 4^3} x^{-5-2} y^{-13-3} = \frac{1}{128} x^{-7} y^{-16}$$

$$= \boxed{\frac{1}{128x^7y^{16}}}$$

$$\begin{aligned}
 \textcircled{\# 142} \quad x^{n-1} x^{3n+4} &= x^{(n-1)+(3n+4)} \\
 &= x^{n-1+3n+4} \\
 &= \boxed{x^{4n+3}}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{\# 144} \quad \left(\frac{x^{3-2}}{x^{6-n}} \right)^{-2} &= \left(x^{(3-2)-(6-n)} \right)^{-2} \\
 &= \left(x^{3-2-6+n} \right)^{-2} \\
 &= \left(x^{-3} \right)^{-2} = \boxed{x^6}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{\# 143} \quad \left(x^{-4n} x^n \right)^{-3} &= \left(x^{-4n+n} \right)^{-3} \\
 &= \left(x^{-3n} \right)^{-3} \\
 &= \boxed{x^{9n}}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{\# 145} \quad \left(\frac{x^n y^{3n+1}}{y^n} \right)^3 &= \left(x^n y^{3n+1-n} \right)^3 \\
 &= \left(x^n y^{2n+1} \right)^3 \\
 &= x^{3n} y^{3(2n+1)} \\
 &= \boxed{x^{3n} y^{6n+3}}
 \end{aligned}$$