HW02

Exponents

(a) 10^3	$10^3 = \underbrace{10 \cdot 10 \cdot 10}_{\text{3 factors of 10}} = 1000$
(b) $(-3)^4$	
(c) -3^4	
(d) $2 \cdot 5^2$	
(e) $(2 \cdot 5)^2$	

Orders of Operations = PEMDAS = Parentheses, Exponents, Multiplication, Division, Addition, Substraction

Evaluate $3 \cdot 9 - 2^5 \div 4$	$3 \cdot 9 - 2^5 \div 4 = 3 \cdot 9 - 32 \div 4$ Evaluate the exponential $= 27 - 32 \div 4$ Multiply $= 27 - 8$ Divide $= 19$ Subtract
Evaluate $(30 - 5) \cdot 3 \div 15 + 7$	
Evaluate $\dfrac{2^4 - 11}{9 + 3 \cdot 2}$	
Evaluate $\dfrac{-7^2 - (-9)}{6(-3) - 1(-2)}$	
Evaluate $6x^2 + 5y - 3z$ using $x = -4$, $y = 3$, and $z = -6$.	
Evaluate $\dfrac{4y - 3(x-1)^2}{z + 9}$ using $x = -4$, $y = 3$, and $z = -6$.	
Evaluate $\dfrac{\frac{x}{4} + \frac{y}{3}}{\frac{z}{2} - \frac{x}{2}}$ using $x = -4$, $y = 3$, and $z = -6$.	

Absolute Value Evaluate Expression

(a) $\lvert -6.85 \rvert$	6.85
(b) $-\lvert 50 \rvert$	
(c) $-\left\lvert -\frac{2}{3} \right\rvert =$	
(d) $\lvert y \rvert$, if $y = \sqrt{2}$	

Let $m = 13$ and $n = -9$. Evaluate each expression.

(a) $\lvert 3m + 5n \rvert =$	$\lvert 3(13) + 5(-9) \rvert$ $\lvert 39 - 45 \rvert = \lvert -6 \rvert = 6$
(b) $\frac{\lvert 2m \rvert - 3\lvert n \rvert}{\lvert m + n \rvert} =$	

Distributive Property

(a) $8(m - 2n) =$	$8(m - 2n) = 8m - 16n$
(b) $-(-3r + 5s) =$	
(c) $\frac{3}{4}\left(\frac{5}{6}p + \frac{1}{2}q - 28\right)$	

Polynomials

(a) $m^6 \cdot m^8$	$m^{6+8} = m^{14}$
(b) $\left(-5r^3\right)\left(6r^4\right)(-3r) =$	
(a) $\left(7^3\right)^5$	
(b) $\left(2^5 y^3\right)^4$	
(c) $\left(\frac{4^3}{z^2}\right)^5 =$	
(d) $\left(\frac{-3a^3}{bc^4}\right)^2 =$	

Evaluation of the 0 power

(a) 8^0	(a) $8^0 = 1$
(b) -8^0	
(c) $(-8)^0$	
(d) $-(-8)^0$	
(e) $(-3b^8)^0$	

Adding and Subtracting Polynomials

(a) $(17x^3 - 10x^2 + x) + (-9x^3 + 10x^2 - 5x)$	$(17-9)x^3 + (-10+10)x^2 + (1-5)x$ $8x^3 - 4x$
(b) $(-6m^4 - 11m^2 + 21) - (m^4 - 6m^2 + 35)$	
(c) $(10r^3s^6 + 5r^6s^3) + (25r^3s^6 - 15r^6s^3)$	
(d) $6(z^2 - 5z + 3) - 4(3z^2 - 2z + 9)$	

Multiplying Polynomials

Multiply $(4t-5)(3t^2 - 2t + 7)$	$3t^2 - 2t + 7$ $4t - 5$ $-15t^2 + 10t - 35$ ← $-5(3t^2 - 2t + 7)$ $12t^3 - 8t^2 + 28t$ ← $4t(3t^2 - 2t + 7)$ $12t^3 - 23t^2 + 38t - 35$ Add in columns
$(7y+3)(4y-5)$	Hint use FOIL = First Outer Inner Last F O I L $(7y)(4y) + (7y)(-5) + 3(4y) + 3(-5)$ $28y^2 - 23y - 15$ $-35y + 12y = -23y$
$(6p+11)(6p-11)$	
$x^3(2x-5)(2x+5)$	
(a) $(7m-10)(7m+10)$	
(b) $(4r^2+9)(4r^2-9)$	

(c) $\left(5x^2-8y^4\right)\left(5x^2+8y^4\right)$	
(d) $(8z+3)^2$	
(e) $\left(5z-12q^3\right)^2$	

Multiplying Complicated Binomials

Find the product: $\left[(4x-3)+7y\right]\left[(4x-3)-7y\right]$	$\left[(4x-3)+7y\right]\left[(4x-3)-7y\right]$ Product of the sum and difference of two terms $=(4x-3)^2-(7y)^2$ $=16x^2-24x+9-49y^2$
Find the product: $(s+4t)^3$	

Dividing Polynomials

Divide $12n^3+11n^2+5n-8$ by $3n+2$	$$\begin{array}{r} 4n^2+n+1 \\ 3n+2\overline{)\,12n^3+11n^2+5n-8} \\ \underline{12n^3+\ 8n^2} \\ 3n^2+5n \\ \underline{3n^2+2n} \\ 3n-8 \\ \underline{3n+2} \\ -10 \end{array}$$
Divide $8x^4+12x^2+7x-18$ by x^2+2	

Factoring Polynomials // GCF

(a) $6a^2 - 18a^4 =$	$6a^2\left(1-3a^2\right)$
(b) $14x^3y^2 - 28x^2y^3 + 21x^2y^2$	
(c) $24(x-2)^3 - 16(x-2)^2 + 6(x-2)$	

Factoring by grouping

$r^2s + 3r^2 - 5s - 15 =$	$(r^2s + 3r^2) - (5s + 15)$ $r^2(s+3) - 5(s+3)$ $(r^2 - 5)(s+3)$
$4m^2 - m^2n + 4n - n^2 =$	
$9y^3 - 15y^2 + 6y - 10 =$	