

# Refresher Course Math 1050 and 1060 Practice Problems Set 1

1.) Write each inequality in interval notation and graph:

a.)  $-3 < x \leq 5$

~~$[-3, 5]$~~   $(-3, 5]$



b.)  $\frac{1}{2} \leq x \leq 4$

$[\frac{1}{2}, 4]$



c.)  $x \leq -6$

$(-\infty, -6]$



d.)  $-2 < x$

$(-2, \infty)$



2.) Use inequality notation to describe "w is at least 15".

$15 \leq w$

3.) Identify the variable terms, the constant terms, the degree of the polynomial, and the coefficient of each variable term.

$3x^3 - 4x^6 - 5$

Variable terms:  $3x^3, -4x^6$

Constant terms:  $-5$

Degree:  $6$

Coefficients

$3x^3 \rightarrow 3$

$-4x^6 \rightarrow -4$

$-5 \rightarrow -5$

4.) If  $x=-2$  and  $y=5$ , find  $3x^2 - xy + (y-x)^2$ .

$$\begin{aligned} 3(-2)^2 - (-2)(5) + (5 - (-2))^2 &= 3(4) + 10 + 49 \\ &= 22 + 49 = \boxed{71} \end{aligned}$$

5.) Simplify each of the following:

a.)  $\frac{15x^3y^4}{3x^2y} = \frac{5\cancel{3}x^{\cancel{3}3}\cancel{y}^{\cancel{4}4}}{\cancel{3}x^{\cancel{2}2}\cancel{y}^{\cancel{4}4}} = \boxed{5x^3y^3}$

b.)  $(-2)^{-4} = \frac{1}{(-2)^4} = \frac{1}{16}$

c.)  $(-8)^0 = 1$

d.)  $-(-8)^0 = -1$

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5.) Continuation Simplify each of the following:

$$e.) \frac{(m^8 n^{-4})^2}{m^{-2} n^5} = \frac{m^{16} n^{-8}}{m^{-2} n^5} = \boxed{m^{18} n^{-13}}$$

$$f.) \left( \frac{m^7 x^{15} y^3 z^6}{x^3 m^4 z^2 y^2} \right)^0 = \underline{1}$$

$$g.) \frac{(3p^{-2}q^3)^2(5p^{-1}q^{-4})^{-1}}{(p^2q^{-2})^{-3}}$$

$$\frac{(3p^{-4}q^6)(\frac{1}{5}pq^4)}{p^{-6}q^6} = \boxed{\frac{3}{5}p^3q^4}$$

6.) Write in standard form (without exponents)

a.)  $3.46 \times 10^6$

$3,460,000$

b.)  $25.73 \times 10^{-4}$

$.0002573$

7.) Write in scientific notation:

a.)  $0.00458$

$4.58 \times 10^{-3}$

b.)  $5,623,000$

$5.623 \times 10^6$

8.) Simplify:  $(-9x^3 + 7x^2 - 5x + 3) + (13x^3 + 2x^2 - 8x - 6)$

$= 4x^3 + 9x^2 - 13x - 3$

9.) Multiply:

a.)  $(x-2)(x-6)$

$x^2 - 8x + 12$

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

$-3x^3(2x^2 - 9x - 5)$

$= \boxed{-6x^5 + 27x^4 + 15x^3}$

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

$3x^3 + 4x^2 - 5x + 12x^2 + 16x - 20$

$= \boxed{3x^3 + 16x^2 + 11x - 20}$

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10.) Factor:

a.)  $5x^2 + 30$

$$5(x^2 + 6)$$

b.)  $x(7t+4) + (7t+4)$

$$(x+1)(7t+4)$$

c.)  $8s^2 - 4st + 6sy - 3yt$

$$(4s+3y)(2s-t)$$

d.)  $3p^2 - 4p + 1$

$$(3p-1)(p-1)$$

e.)  $t^2 + t + \frac{1}{4}$

$$\left(t + \frac{1}{2}\right)^2$$

f.)  $x^2 - 1.0x + 0.25$

$$\left(x - \frac{1}{2}\right)^2 = (x - .5)^2$$

g.)  $x^2 + 7x + 8$

Probably a typo.

$$\frac{-7 \pm \sqrt{7^2 - 4(1)(8)}}{2} = \frac{-7 \pm \sqrt{17}}{2}$$

$$\left(x + \frac{7 + \sqrt{17}}{2}\right) \left(x + \frac{7 - \sqrt{17}}{2}\right)$$

h.)  $x^2 - 7x - 8$

~~Probably a typo.~~

$$(x-8)(x+1)$$

i.)  $x^2 + 7x - 8$

$$(x+8)(x-1)$$

j.)  $-3x^2 - x + 4$

$$(3x+4)(-x+1)$$

# Refresher Course Math 1050 and 1060 Practice Problems Set 1

10.) Continuation Factor:

k.)  $5w^2 + 13w - 6$

$$(5w - 2)(w + 3)$$

l.)  $6t^2 + 11tw - 10w^2$

$$(3t - 2w)(2t + 5w)$$

m.)  $50r^2 - 32$

$$2(25r^2 - 16)$$

$$2(5r - 4)(5r + 4)$$

n.)  $16a^2 + 56a + 49$

$$(4a + 7)(4a + 7)$$

o.)  $8k^3 - y^3$

$$(2k - y)(4k^2 + 2ky + y^2)$$

p.)  $10m^2 - 23m + 12$

$$(5m - 4)(2m - 3)$$