

**Math 51 Exam #2 Review – Winter 2016**

**Please Note:** The review sheet is designed for you to have a guide as to what to study. The problems on the exam are not limited to the type of problems on this sheet. Any types of problem from the assigned homework problems are possible exam questions. As a reminder, all word problems will need to be solved using an equation. Please attempt other practice problems other than those presented on this sheet in order to be completely prepared for the exam.

1. Solve the following inequalities. Write the solution set in interval notation.

a.  $5x+1 \geq 3x-9$

b.  $4x-(6x+1) \leq 8x+2(x-3)$

c.  $-w+12+9w > w+9+w$

d.  $2(x-5)+3x < 4(x-6)+1$

e.  $5 < 1-6m < 12$

f.  $-7 \leq 3x-4 \leq 8$

g.  $2 < 6 + \frac{3}{4}x \leq 12$

h.  $-12 \leq \frac{3}{7}x + 2 < -4$

2. Perform the indicated operation.

a.  $(-2b^6 + 3b^4 - b^2) + (b^6 + 2b^4 + 2b^2)$

b.  $(5x^2y - 2xy + 9xy^2) - (8x^2y + 13xy + 12xy^2)$

c.  $[(6t^2 - 3t + 1) - (12t^2 + 2t - 6)] - [(4t^2 - 3t - 8) + (-6t^2 + 10t - 12)]$

3. Multiply each of the following polynomials.

a.  $(5x+3y)(6x-5y)$

b.  $(9y-2)(8y^2-6y+1)$

c.  $5t^4(2t-3)(6t+5)$

d.  $(4x-3)^2$

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

f.  $(2x-5)^3$

g.  $(3x-5y)(2x+7y)$

4. Divide each of the following polynomials.

a.  $(5t^8 + 5t^7 + 15) \div (5t)$

b.  $(16x^6 + 24x^4 + 10x^3) \div (4x^5)$

c.  $(t^2 + 2t - 35) \div (t - 5)$

d. 
$$\frac{6r^4 - 11r^3 - r^2 + 16r - 8}{2r - 3}$$

e.  $(x^3 - 2x^2 + 2x - 5) \div (x + 1)$

f.  $(3x^4 + 2x^3 - 11x^2 - 2x + 5) \div (3x - 4)$

5. Factor each of the following polynomials completely.

a.  $s^2 - 6s - 27$

b.  $m^2 - 12m + 36$

c.  $15x^2 - 14x - 8$

d.  $12x^3 - 2x^2y - 24xy^2$

e.  $27p^{10} - 45p^9 - 252p^8$

f.  $x^2 - 17x + 66$

g.  $y^2 - 4yk - 12k^2$

h.  $4x^5 + 12x^4 - 40x^3$

i.  $20x^2 + 22x + 6$

j.  $9p^2 - 18p + 8$

k.  $24x^2 - 42x + 9$

l.  $6x^2 - 5xy - y^2$

m.  $24x^4 + 10x^3 - 4x^2$

n.  $2w^3 - 2w^2 + 3w - 3$

o.  $15x^2 - 14x - 8$

p.  $-3x^3 + 27x$

q.  $9x^2 - 12xy + 4y^2$

r.  $x^2 - 12x - 28$

s.  $y^3 + 5y^2 - 4y - 20$

t.  $24x^2 - 46x + 10$

u.  $27x^3 - 64y^3$

- v.  $10x^2 + 19x + 6$
- w.  $6x^2 - 7xy - 5y^2$
- x.  $64x^2 - 16y^2$
- y.  $x^2 - 14x + 49$
- z.  $9x^2 + 48xy + 64y^2$
- aa.  $2x^3y - 32xy$

6. Solve the following for  $x$ .

- a.  $x^2 - x - 20 = 0$
- b.  $x^2 - 4x = 12$
- c.  $6x^2 - 7x + 2 = 0$
- d.  $6x^2 = 4 + 5x$
- e.  $x^2 = 121$
- f.  $(x - 6)(2x^2 - 5x - 3) = 0$

7. The product of two consecutive integers is 4 less than 4 times their sum. Find the integers.

8. The width of a toolbox is 3 feet less than its length. The toolbox is 2 feet high and the volume of the tool box is 80 cubic feet. What are the length and the width of the toolbox?

9. Find three consecutive odd integers such that the sum of all three is 42 less than the product of the larger two.

10. The length of a VHS videocassette shell is 3 inches more than its width. The area of the rectangular top side of the shell is 28 square inches. Find the length and the width of the videocassette shell.

10. Perform the indicated operation.

- a.  $\frac{x^3y^2}{x^2y^4} \cdot \frac{y^6}{x^5}$
- b.  $\frac{4}{p+2} + \frac{1}{3p+6}$
- c.  $\frac{x+1}{3-x} + \frac{x^2}{x-3}$
- d.  $\frac{2}{x^2-4x} - \frac{3}{x^2-16}$

$$e. \frac{4m}{m^2 + 3m + 2} + \frac{2m - 1}{m^2 + 6m + 5}$$

$$f. \frac{2y^2 + y - 6}{2y^2 - 9y + 9} \cdot \frac{y^2 - 2y - 3}{y^2 - 1}$$

$$g. \frac{3t^2 - t}{6t^2 + 15t} \div \frac{6t^2 + t - 1}{2t^2 - 5t - 25}$$

$$h. \frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} - \frac{1}{y}}$$

$$i. \frac{\frac{1}{m^3 p} + \frac{2}{mp^2}}{\frac{4}{mp} + \frac{1}{m^2 p}}$$