










## INTERMEDIATE ALGEBRA

### Part I:

1.  $\frac{10!}{6!4!} = ?$
2.  $3\sqrt[3]{16} + 2\sqrt[3]{54} = ?$
3. Simplify  $\frac{x^2 + 4x + 3}{x^2 - 1}$ .
4. Solve the system of equations.  
 $2x + 3y = 7$   
 $-x + y = 4$
5. Simplify  $|-3(2)| + 2^3 - 4|-1|$ .
6. Solve  $|3 - x| \leq 12$ .
7. Solve  $5 - \frac{x}{3} = 4x$ .
8. Graph the equation  $y = 2x^2 - 1$ .
9. Solve for  $x$  and graph the solution.  $3x - 4 > 5x - 8$
10. For which intervals is the statement  $5 - \frac{x}{4} > x$  true?

### Intermediate Algebra Part II:

1.  $\frac{12!}{5!8!} = ?$  a) 99 b) 20 c) 11,880 d) 495
2.  $-4\sqrt{8} + 6\sqrt{18} = ?$  a)  $2\sqrt{10}$  b) 286 c)  $10\sqrt{2}$  d)  $12\sqrt{2}$
3. Simplify  $\frac{x^2 - 2x - 24}{x^2 + 10x + 24}$ ,  $x \neq -4$ .  
a)  $\frac{-2x - 24}{10x + 24}$  b)  $-\frac{1}{5}$  c)  $\frac{x - 6}{x + 6}$  d) -1
4. Solve the system of equations.  
 $5x + 3y = 8$   
 $x + 6y = 7$   
a)  $(\frac{8}{5}, \frac{7}{6})$  b) (1, 1) c) (1, -1) d)  $(\frac{29}{15}, -\frac{5}{9})$

5. Simplify  $-2|-2+6|-4^2+|-3|$   
 a) -21      b) 11      c) -27      d) 21
6. Solve  $|x+7|>3$       a)  $x > -4$  or  $x < -10$       b)  $-3 < x < 3$   
 c)  $-11 < x$       d)  $x < -4$  and  $x > -10$
7. Solve  $\frac{3x}{2} - \frac{x}{3} = 7$ .  
 a) 1      b)  $-7/2$       c)  $21/6$       d) 6
8. Pick the graph that best fits the equation  $y = 4 - x$   
 a)       b)       c)       d) 
9. Solve for x and graph the solution set.  $7x - 3 \leq 2x + 12$   
 a)       b)       c)       d) 
10. Which set describes the graph   
 a)  $(-1, 5)$       b)  $(-1, 5]$       c)  $[-1, 5]$       d)  $x > -1$

**Note:** There is only one answer, but there may be several ways to obtain the answer. Only one method is given.

### Solutions to Intermediate Algebra Part I.

1. Write out the factorials  $\frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$  and cancel common factors  $\frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{4 \cdot 3 \cdot 2 \cdot 1 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$ . Multiply the remaining factors  $\frac{10 \cdot 3 \cdot 7}{1} = \mathbf{210}$

2. Simplify the radicals by finding the perfect cube factors.

$$3\sqrt[3]{8} \cdot \sqrt[3]{2} + 2\sqrt[3]{27} \cdot \sqrt[3]{2}$$

Evaluate the perfect cubes.  $3 \cdot 2 \cdot \sqrt[3]{2} + 2 \cdot 3 \cdot \sqrt[3]{2}$  Simplify and combine the terms with like radicands.  $6\sqrt[3]{2} + 6\sqrt[3]{2} = \mathbf{12\sqrt[3]{2}}$ .

3. Factor the numerator and denominator.  $\frac{(x+3)(x+1)}{(x+1)(x-1)}$ . Cancel common factors  $\frac{(x+3)\cancel{(x+1)}}{\cancel{(x+1)}(x-1)} = \frac{\mathbf{x+3}}{\mathbf{x-1}}$ .

4. Multiply the second equation by 2 and add it to the first equation to eliminate the x-variable.

$$2x + 3y = 7 \qquad 2x + 3y = 7$$

$$2(-x + y = 4) \qquad -2x + 2y = 8$$

$$5y = 15$$

Solve for y, then back substitute into one of the original equations to find x.

$$\mathbf{y = 3}$$

$$2x + 3(3) = 7$$

$$2x = -2, \quad \mathbf{x = -1}$$

as an ordered pair  $(-1, 3)$

5. Simplify the exponents and inside the grouping symbols  $|-6| + 8 - 4 \cdot 1$   
 Evaluate the remaining absolute value symbol and perform the addition and subtraction.  $6 + 8 - 4 = 10$

6. Write down both possibilities and solve them independently.

$$3 - x \leq 12$$

$$-x \leq 9$$

$$\mathbf{x \geq -9}$$

$$-(3 - x) \leq 12$$

$$-3 + x \leq 12$$

$$\mathbf{x \leq 15}$$

7. Eliminate the fractions by multiplying by the lowest common denominator, 3.

$$3 \cdot 5 - 3\left(\frac{x}{3}\right) = 3(4x)$$

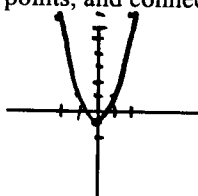
$$15 - x = 12x$$

$$15 = 13x$$

$$\mathbf{x = 15/13}$$

8. Make a list of ordered pairs, plot the points, and connect to form a parabola.

x	y=2x <sup>2</sup> -1
-2	7
-1	1
0	-1
1	1
2	7



9. Isolate the x. Remember to flip the inequality sign when multiplying or dividing by a negative number.

$$-2x > -4$$

$$\mathbf{x < 2}$$

10. Multiply both sides by 4 to eliminate the fractions. Then isolate x.

$$4\left(5 - \frac{x}{4}\right) > 4(x)$$

$$20 - x > 4x$$

$$20 > 5x$$

$$\mathbf{4 > x}$$

#### Solutions to Intermediate Algebra Part II

- 1) A 2) C 3) C 4) B 5) C 6) A 7) D 8) D  
 9) A 10) B