

## Math 0308 Final Exam Review

#	Problem	Section	Answers
<b>Solve the given equations in #1 - #13.</b>			
1.	$6x - 5 = 16$	2.3	$\left\{\frac{7}{2}\right\}$
2.	$5x + 6 - 6x = -x + 6$	2.4	{all real numbers}
3.	$\frac{1}{4} + \frac{1}{3}(5x + 2) = -2$	2.4	$\left\{-\frac{7}{4}\right\}$
4.	$3(2x - 4) = 8x - 6$	2.4	{-3}
5.	$5(2x - 3) - 1 = 10x + 3$	2.4	$\emptyset$
6.	$7(x - 8) - (2x - 27) = -29$	2.4	{0}
7.	$x^2 - 64 = 0$	4.8	{ $\pm 8$ }
8.	$x^2 = 4x$	4.8	{0, 4}
9.	$2x^2 + x - 15 = 0$	4.8	$\left\{\frac{5}{2}, -3\right\}$
10.	$3x^2 + 18x + 21 = x(x + 5)$	4.8	$\left\{-\frac{7}{2}, -3\right\}$
11.	$(3x - 8)(x - 4) = 7$	4.8	$\left\{5, \frac{5}{3}\right\}$
12.	$\frac{3}{4x} + \frac{1}{x} = \frac{7}{12}$	5.6	{3}
13.	$\frac{x}{x-2} + \frac{1}{x+2} = \frac{-4}{x^2-4}$	5.6	{-1}
<b>Solve the given system in #14 by graphing.</b>			
14.	$2x - y = 4$ $x - 3y = -3$	7.1	{3, 2} *
<b>Solve the given systems in #15 - #17.</b>			
15.	$x = 3y - 1$ $5x - 7y = 19$	7.2	(8, 3)
16.	$3x + y = -3$ $6x + 2y = -6$	7.3	dependent system many solutions
17.	$3x + 8y = -46$ $2x - 5y = 21$	7.3	(-2, -5)

\* The graph is at the end of the review.

Solve the given inequalities in #18 and #19.  
Graph the solution set on a number line.

18.	$5 - 2x > 13$	2.9	$x < -4$ 
19.	$-2 \leq 4x + 1 \leq 5$	2.9	$-\frac{3}{4} \leq x \leq 1$ 

Evaluate #20 - #27.

20.	$-5^2$	3.1	-25
21.	$(-4)^{-1}$	3.2	$-\frac{1}{4}$
22.	$3^0 + 3^{-1}$	3.2	$\frac{4}{3}$
23.	$\sqrt{64}$	8.1	8
24.	$\sqrt[3]{27}$	8.1	3
25.	$\sqrt[3]{-8}$	8.1	-2
26.	$\sqrt{-81}$	8.1	not a real number
27.	$-\sqrt{\frac{16}{49}}$	8.1	$-\frac{4}{7}$

Simplify #28 - #32.

28.	$\left(\frac{3x^2y^3}{x^{-3}y^{-4}}\right)^{-2}$	3.2	$\frac{1}{9x^{10}y^{14}}$
29.	$(2x^{-5}y^6)^3(-3xy^0z)^{-5}$	3.2	$-\frac{8y^{18}}{243x^{20}z^5}$
30.	$\sqrt{45}$	8.2	$3\sqrt{5}$
31.	$\sqrt{12x^2}$	8.2	$2x\sqrt{3}$
32.	$\sqrt{32x^2y^3}$	8.2	$4xy\sqrt{2y}$

Completely factor #33 - #49.

33.	$8x^4y - 12x^4y^2 + 4x^3y$	4.1	$4x^3y(2x - 3xy + 1)$
34.	$x^2 - 121$	4.2	$(x - 11)(x + 11)$
35.	$36x^2 + 9y^2$	4.2	$9(4x^2 + y^2)$
36.	$3x^2 - 75$	4.2	$3(x + 5)(x - 5)$
37.	$16x^4 - y^4$	4.2	$(4x^2 + y^2)(2x + y)(2x - y)$
38.	$x^2 - 20x + 100$	4.2	$(x - 10)^2$

39.	$2x^2 + 8x + 8$	4.2	$2(x+2)^2$
40.	$x^2 + 2x - 35$	4.3	$(x+7)(x-5)$
41.	$-x^2 + 9x - 14$	4.3	$-(x-2)(x-7)$
42.	$3x^2 + 18x - 21$	4.3	$3(x-1)(x+7)$
43.	$x^2 - 4x + 2$	4.3	Prime
44.	$x^2 + 4xy - 12y^2$	4.3	$(x+6y)(x-2y)$
45.	$6x^2 + 7x + 2$	4.4	$(3x+2)(2x+1)$
46.	$3x^2 + 4x - 7$	4.4	$(3x+7)(x-1)$
47.	$3x^3 - 24x^2 + 36x$	4.3	$3x(x-2)(x-6)$
48.	$2xy + 3y - 10x - 15$	4.5	$(2x+3)(y-5)$
49.	$27 - 64m^3$	4.6	$(3-4m)(9+12m+16m^2)$

**Perform the indicated operation in #50 - #67.**

50.	$(-x^2 - 3x - 5) - (-2x^2 - x + 2)$	3.3	$x^2 - 2x - 7$
51.	$\left(\frac{5}{2}x^2 - \frac{3}{2}xy + \frac{1}{4}y^2\right) + \left(\frac{3}{8}x^2 + \frac{2}{3}xy - \frac{3}{4}y^2\right)$	3.3	$\frac{23}{8}x^2 - \frac{5}{6}xy - \frac{1}{2}y^2$
52.	$(5a-3)(2a+7)$	3.4	$10a^2 + 29a - 21$
53.	$(2x-1)^2$	3.5	$4x^2 - 4x + 1$
54.	$\left(\frac{1}{2}x+3\right)\left(\frac{1}{2}x-3\right)$	3.5	$\frac{1}{4}x^2 - 9$
55.	$(5x-2)(3x^2+2x-2)$	3.4	$15x^3 + 4x^2 - 14x + 4$
56.	$\frac{20x^4 - 15x^3y + 5x^2y^2 - 15y^4}{5x^2y}$	3.6	$\frac{4x^2}{y} - 3x + y - \frac{3y^3}{x^2}$
57.	$2x-3 \overline{)4x^3 - 8x^2 + 11x - 9}$	3.6	$2x^2 - x + 4 + \frac{3}{2x-3}$
58.	$\frac{5x^5 \cdot 2y^2}{2y^4 \cdot 15x^4}$	3.2	$\frac{x}{3y^2}$
59.	$\frac{8x^2}{5y} \div \frac{14x^4}{10y^6}$	5.2	$\frac{8y^5}{7x^2}$
60.	$\frac{x^2+3x-4}{8x^3} \cdot \frac{4x^4}{5x^3-5x^2}$	5.2	$\frac{x+4}{10x}$
61.	$\frac{4-x}{2x^2+5x+3} \div \frac{x^2+x-20}{2x+3}$	5.2	$\frac{-1}{(x+1)(x+5)}$
62.	$\frac{3x}{x+1} + \frac{5}{x+1}$	5.3	$\frac{3x+5}{x+1}$
63.	$\frac{4x+3}{x^2-25} + \frac{x-12}{25-x^2}$	5.3	$\frac{3}{(x-5)}$

64.	$\frac{1}{3xy} - \frac{5}{9y}$	5.4	$\frac{3-5x}{9xy}$
65.	$\frac{4}{3x^2+12x} - \frac{1}{x^2+5x+4}$	5.4	$\frac{1}{3x(x+1)}$
66.	$\frac{3}{2x-1} - \frac{5}{2x}$	5.4	$\frac{5-4x}{2x(2x-1)}$
67.	$\frac{x+4}{2x^2-7x+5} - \frac{3}{x^2-2x+1}$	5.4	$\frac{x^2-3x+11}{(2x-5)(x-1)^2}$
<b>Graph #68 - #70</b>			
68.	$3x - 4y = 12$	6.3	*
69.	$3x - y = 6$	6.3	*
70.	$y = \frac{3}{2}x - 1$	6.3	*

\*The graph is at the end of the review

**Use algebraic expressions to solve the given word problems in #71 - #75.**

71. A 64 in. board is cut into 3 pieces. The second piece is three times as long as the first piece. The third piece is 4 in. longer than the first piece. How long is each piece? (2.7) 12", 36", 16"

72. Karla has \$4.60 in nickels and quarters. She has a total of 36 coins. How many of each coin does she have? (2.7) n-22, q-14

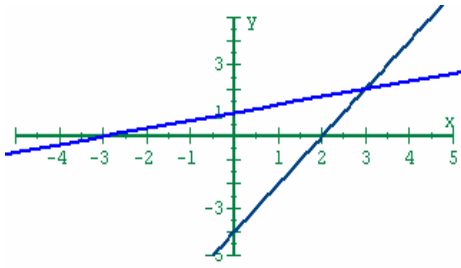
73. The sum of two numbers is 6. The sum of their squares is 180. What are the two numbers? (4.9)  $\{-6, 12\}$

74. The length of a rectangle is 3 in. more than twice the width. If the area of the rectangle is 20 sq in., what are the dimensions of the rectangle? (4.9) 8"  $\times$  2 1/2"

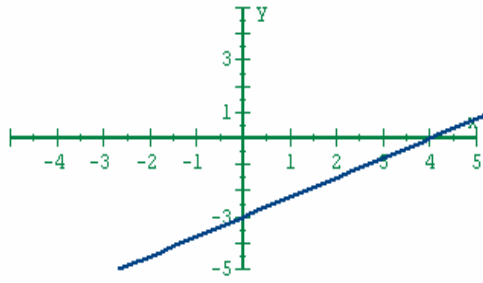
75. Elvira has \$2.95 in nickels and dimes. The number of dimes is 3 less than two times the number of nickels. How many of each coin does she have? (7.4) n-13, d-23

**\* Graphs**

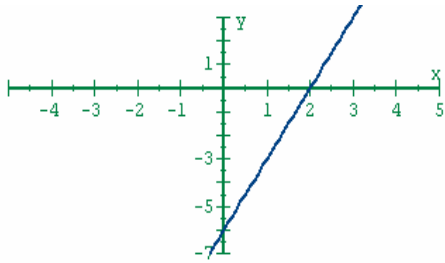
**14.**



**68.**



**69.**



**70.**

