1.   Factor each type of expression:

Factor GCF:

(a) $6x^2 - 6x$ 　　　　　　(b) $10n^4 - 6n^2 + 2n$ 　　　　(c) $27x^3y^3 - 63x^2y^2 + 9x^2y$

Factor trinomials $a = 1$:

(d) $x^2 + x - 6$ 　　　　　(e) $x^2 + 3x - 28$ 　　　　　(f) $n^2 - 8n - 20$

(g) $a^2 - 14a + 49$ 　　　(h) $x^2 - 16x + 64$ 　　　　(i) $3y^2 - 9y - 84$

Factor trinomials $a > 1$:

(j) $2x^2 + 7x - 4$ 　　　　(k) $4t^2 + 12t + 5$ 　　　　(l) $3x^2 - 17x - 6$

(m) $2a^2 - 16a + 32$

 Factor by grouping:

(n) $4t^2 + 2t + 10t + 5$ 　(o) $6a^2 - 8a - 3a + 4$ 　　(p) $2y^2 + 8y - y - 4$

Factor completely:

(q) $x^2 - 49$ 　　　　　　(r) $6a^2 - 24$ 　　　　　　　(s) $2t^2 - 72$

(t) $3x^2 + 9x + 6$ 　　　　(u) $36 - x^2$ 　　　　　　　(v) $45x^3 - 20xy^2$

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2.   Solve:

(a) $(x + 3)(x + 10) = 0$ 　　　　　　(b) $8x(x - 7) = 0$

(c) $x^2 - 10x = 0$ 　　　　　　　　　(d) $x^2 = 64$

(e) $9t^2 = 25$ 　　　　　　　　　　　(f) $4t^2 - 8t = 0$

(g) $n^2 + 11n + 18 = 0$ 　　　　　　(h) $n^2 + 8n = -15$

3.   Solving a system of two equations by <u>Graphing Method</u>:

(a) $y = 3x - 3$
     $y = -7x + 7$

(b) $y = -2x + 4$
     $y = -5x + 10$

(c) $y = -4x + 8$
     $x - y = 7$

(d) $y = \frac{3}{2}x + 3$
     $y = 6x - 6$

4.   Solving a system of two equations by <u>Substitution Method</u>:

(a) $x = y + 1$
     $x + 2y = 13$

(b) $y = 2x - 1$
     $3y - x = 12$

(c) $x = y - 6$
     $3x + 2y = 2$

(d) $x + y = -6$
     $5x + 4y = -29$

5.   Solving a system of two equations by <u>Elimination by Addition Method</u>:

(a) $x + y = 6$
     $-x + 4y = -1$

(b) $2x - y = 1$
     $x + 3y = 4$

(c) $-x - y = 10$
     $5x - y = -26$

(d) $2x - 3y = 16$
     $3x + 4y = 7$

6.   Simplify:

(a) $-\sqrt{81}$

(b) $-\sqrt{225}$

(c) $\sqrt{400}$

(d) $\sqrt{361}$

(e) $\sqrt{90}$

(f) $\sqrt{48}$

7.   Multiply and then simplify if possible:

   (a) $\sqrt{3} \cdot \sqrt{18}$ (c) $\sqrt{5} \cdot \sqrt{10}$ (e) $\sqrt{3}(5 + \sqrt{3})$

   (b) $\sqrt{3} \cdot \sqrt{27}$ (d) $\sqrt{2}(\sqrt{3} + \sqrt{5})$ (f) $(5 + \sqrt{2})(6 + \sqrt{2})$

   (g) $(\sqrt{7} - \sqrt{5})(\sqrt{7} + \sqrt{5})$

8.   Divide Radical Expressions:

   (a) $\dfrac{\sqrt{28}}{\sqrt{7}}$ (b) $\dfrac{\sqrt{75}}{\sqrt{15}}$ (c) $\dfrac{\sqrt{2}}{\sqrt{32}}$

   (d) $\dfrac{\sqrt{250}}{\sqrt{40}}$ (e) $\sqrt{\dfrac{9}{25}}$ (f) $\dfrac{\sqrt{75}\sqrt{5}}{\sqrt{3}}$

   Rationalizing the denominators:

   (g) $\dfrac{1}{\sqrt{6}}$ (h) $\dfrac{6}{\sqrt{3}}$ (i) $\sqrt{\dfrac{7}{3}}$

9.   Adding and Subtracting Radical Expressions:

   (a) $3\sqrt{6} + 2\sqrt{6}$ (b) $6\sqrt{7} - 3\sqrt{7}$ (c) $2\sqrt{10} + 6\sqrt{10} + 10\sqrt{20}$

   (d) $5\sqrt{6} - 4\sqrt{6} + 9\sqrt{6}$ (e) $\sqrt{18} + \sqrt{50}$ (f) $7\sqrt{32} + \sqrt{8} - \sqrt{50}$

   (g) $8\sqrt{7} - \sqrt{28}$ (h) $3\sqrt{24} - 7\sqrt{24}$ (i) $5\sqrt{72} - 3\sqrt{98} - 4\sqrt{128}$

10.   In a right triangle with side a, side b, and hypotenuse c, find the length of the side
       not given:

(a) a=5, b=12, c=?   (b) a=3, b=5, c=?

(c) a=12, b=?, c=13   (d) a=9, b=?, c=15

(e) a=?, b=7, c=9   (f) a=?, b=6, c=10

Math 20 Review For Exam #3 Revised for Winter 2019

Answer Key

1a. $6x(x-1)$	1b. $2n(5n^3-3n+1)$	1c. $9x^2y(3xy^2-7y+1)$	1d. $(x+3)(x-2)$	1e. $(x+7)(x-4)$	1f. $(n-10)(n+2)$
1g. $(a-7)(a-7)$	1h. $(x-8)(x-8)$	1i. $3(y+4)(y-7)$	1j. $(2x-1)(x+4)$	1k. $(2t+1)(2t+5)$	1l. $(3x+1)(x-6)$
1m. $2(a-4)(a-4)$	1n. $(2t+1)(2t+5)$	1o. $(2a-1)(3a-4)$	1p. $(y+4)(2y-1)$	1q. $(x-7)(x+7)$	1r. $6(a^2-4) \rightarrow$ $6(a-2)(a+2)$
1s. $2(t+6)(t-6)$	1t. $3(x+1)(x+2)$	1u. $(6+x)(6-x)$	1v. $5x(9x^2-4y^2) \rightarrow 5x(3x+2y)(3x-2y)$		
2a. $x=-3, x=-10$	2b. $x=0, x=7$	2c. $x=0, x=10$	2d. $x=8, x=-8$	2e. $t=-\dfrac{5}{3}$ $t=\dfrac{5}{3}$	2f. $t=0, t=2$
2g. $n=-2, n=-9$	2h. $n=-5, n=-3$				
3a. (1,0)	3b. (2,0)	3c. (3, –4)	3d. (2,6)		
4a. (5,4)	4b. (3,5)	4c. (–2,4)	4d. (–5,–1)		
5a. (5,1)	5b. (1,1)	5c. (–6,–4)	5d. (5,–2)		
6a. -9	6b. -15	6c. 20	6d. 19	6e. $3\sqrt{10}$	6f. $4\sqrt{3}$
7a. $3\sqrt{6}$	7b. 9	7c. $5\sqrt{2}$	7d. $\sqrt{6}+\sqrt{10}$	7e. $3+5\sqrt{3}$	7f. $32+11\sqrt{2}$
7g. 2					
8a. 2	8b. $\sqrt{5}$	8c. $\dfrac{1}{4}$	8d. $\dfrac{5}{2}$	8e. $\dfrac{3}{5}$	8f. $5\sqrt{5}$
8g. $\dfrac{\sqrt{6}}{6}$	8h. $2\sqrt{3}$	8i. $\dfrac{\sqrt{21}}{3}$			
9a. $5\sqrt{6}$	9b. $3\sqrt{7}$	9c. $8\sqrt{10}+20\sqrt{5}$	9d. $10\sqrt{6}$	9e. $8\sqrt{2}$	9f. $25\sqrt{2}$
9g. $6\sqrt{7}$	9h. $-8\sqrt{6}$	9i. $-23\sqrt{2}$			
10a. 13	10b. $\sqrt{34}$	10c. 5	10d. 12	10e. $4\sqrt{2}$	10f. 8