

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) $45x^3 - 20xy^2$

2. Solve:

(a) $(x + 3)(x + 10) = 0$ (b) $8x(x - 7) = 0$
(c) $x^2 - 10x = 0$ (d) $9t^2 = 25$
(e) $4t^2 - 8t = 0$ (f) $n^2 + 11n + 18 = 0$
(g) $n^2 + 8n = -15$ (h) $3x^2 - 2x = 9 - 8x$

3. Solving a system of two equations by Graphing Method:

(a) $y = 3x - 3$ (b) $y = -2x + 4$
 $y = -7x + 7$ $y = -5x + 10$

Math 20 Review For Exam #3 Revised July 2017

(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 Substitution Method:

(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 Elimination by Addition Method:

(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 by factoring, 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) $\frac{\sqrt{28}}{\sqrt{7}}$	(b) $\frac{\sqrt{75}}{\sqrt{15}}$	(c) $\frac{\sqrt{2}}{\sqrt{32}}$
(d) $\frac{\sqrt{250}}{\sqrt{40}}$	(e) $\sqrt{\frac{9}{25}}$	(f) $\frac{\sqrt{75}\sqrt{5}}{\sqrt{3}}$

Rationalizing the denominators:

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

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. Solve by using the square root principle:

(a) $x^2 = 64$	(b) $7t^2 = 21$	(c) $4x^2 - 10 = 0$
(d) $(a+6)^2 = 4$	(e) $3x^2 = 48$	(f) $x^2 - 60 = 0$

Math 20 Review For Exam #3 Revised July 2017

11. 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) $a=3, a=5, c=?$

(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 July 2017

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. $t=-\frac{5}{3}, t=\frac{5}{3}$	2e. $t=0, t=2$	2f. $n=-2, n=-9$
2g. $n=-5, n=-3$	2h. $x=-3, x=1$				
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. $\frac{1}{4}$	8d. $\frac{5}{2}$	8e. $\frac{3}{5}$	8f. $5\sqrt{5}$
8g. $\frac{\sqrt{6}}{6}$	8h. $2\sqrt{3}$	8i. $\frac{\sqrt{21}}{3}$			
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. $x=-8, x=8$	10b. $t=-\sqrt{3}, t=\sqrt{3}$	10c. $x=-\sqrt{\frac{5}{2}}, x=\sqrt{\frac{5}{2}}$	10d. $a=-8,$ $a=-4$	10e. $x=-4,$ $x=4$	10f. $x=-2\sqrt{15},$ $x=2\sqrt{15}$
11a. 13	11b. $\sqrt{34}$	11c. 5	11d. 12	11e. $4\sqrt{2}$	11f. 8