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Test REVIEW: Solving Quadratics by Factoring and Square Roots

Part I: Solve by Factoring.

1. $x^2 - 19x = 0$	2. $36x^2 + 48x = 0$
3. $x^2 - 121 = 0$	4. $144x^2 - 49 = 0$
5. $x^2 + 12x - 28 = 0$	6. $x^2 - 10x - 39 = 0$
7. $x^2 - 20x + 100 = 0$	8. $x^2 - 2x - 15 = 0$
9. $2x^2 + 14x - 36 = 0$	10. $x^2 - 9x + 8 = 0$
11. $5x^2 - 3x - 2 = 0$	12. $6x^2 - 41x - 7 = 0$

Part II: Solve by taking square roots. If necessary, leave answers in fraction form and simplified radicals.

13. $25x^2 + 11 = 60$	14. $9x^2 - 3 = 22$
15. $x^2 - 13 = 0$	16. $5x^2 = 160$
17. $x^2 - 5 = 15$	18. $(x - 5)^2 = 16$
19. $4(2x - 5)^2 = 16$	20. $-5(x + 2)^2 = 40$

Name Worked on Solutions

Test REVIEW: Solving Quadratics by Factoring and Square Roots

Part I: Solve by Factoring.

1. $x^2 - 19x = 0$ GCF: x $x(x-19) = 0$ $x = 0 \quad x - 19 = 0$ $\quad \quad \quad \begin{array}{r} +19 +19 \\ \hline x = 19 \end{array}$ $\{0, 19\}$	2. $36x^2 + 48x = 0$ GCF: $12x$ $12x(3x+4) = 0$ $12x = 0 \quad 3x+4 = 0$ $x = 0 \quad \begin{array}{r} -4 -4 \\ 3x = -4 \\ \hline x = -\frac{4}{3} \end{array}$ $\{0, -\frac{4}{3}\}$
3. $x^2 - 121 = 0$ D.O.T.S. $(x+11)(x-11) = 0$ $\begin{array}{r} x+11=0 \quad x-11=0 \\ \begin{array}{r} -11 -11 \\ \hline x = -11 \end{array} \quad \begin{array}{r} +11 +11 \\ \hline x = 11 \end{array} \end{array}$ ± 11 or $\{11, -11\}$	4. $144x^2 - 49 = 0$ D.O.T.S. $(12x-7)(12x+7) = 0$ $12x-7=0 \quad 12x+7=0$ $\begin{array}{r} +7 +7 \\ 12x = 7 \\ \hline x = \frac{7}{12} \end{array} \quad \begin{array}{r} -7 -7 \\ 12x = -7 \\ \hline x = -\frac{7}{12} \end{array}$ $\pm \frac{7}{12}$ or $\{\frac{7}{12}, -\frac{7}{12}\}$
5. $x^2 + 12x - 28 = 0$ $\begin{array}{r} -28 \\ 1 \quad 28 \\ \hline -2 \quad +14 \end{array}$ $(x-2)(x+14) = 0$ $x-2=0 \quad x+14=0$ $x=2 \quad x=-14$ $\{2, -14\}$	6. $x^2 - 10x - 39 = 0$ $\begin{array}{r} -39 \\ -3 \quad +13 \\ \hline +3 \quad -13 \end{array}$ $(x+3)(x-13) = 0$ $x+3=0 \quad x-13=0$ $x=-3 \quad x=13$ $\{-3, 13\}$
7. $x^2 - 20x + 100 = 0$ $\begin{array}{r} +100 \\ -10 \quad -10 \\ \hline \end{array}$ $(x-10)(x-10) = 0$ $x-10=0$ $x=10$ $\{10\}$	8. $x^2 - 2x - 15 = 0$ $\begin{array}{r} -15 \\ -5 \quad +3 \\ \hline \end{array}$ $(x-5)(x+3) = 0$ $x-5=0 \quad x+3=0$ $x=5 \quad x=-3$ $\{5, -3\}$
9. $2x^2 + 14x - 36 = 0$ * GCF First! $2(x^2 + 7x - 18) = 0$ $\begin{array}{r} -18 \\ +9 \quad -2 \\ \hline \end{array}$ $2(x+9)(x-2) = 0$ $2 \neq 0 \quad x+9=0 \quad x-2=0$ $x=-9 \quad x=2$ $\{-9, 2\}$	10. $x^2 - 9x + 8 = 0$ $\begin{array}{r} +8 \\ -1 \quad -8 \\ \hline \end{array}$ $(x-1)(x-8) = 0$ $x-1=0 \quad x-8=0$ $x=1 \quad x=8$ $\{1, 8\}$
11. $5x^2 - 3x - 2 = 0$ Bust B'method: $\begin{array}{r} -10x^2 \\ -5x + 2x \\ \hline \end{array}$ $5x^2 - 5x + 2x - 2$ $5x(x-1) + 2(x-1)$ $(x-1)(5x+2) = 0$ $x-1=0 \quad 5x+2=0$ $x=1 \quad x=-\frac{2}{5}$ $\{1, -\frac{2}{5}\}$	12. $6x^2 - 41x - 7 = 0$ B.B method: $\begin{array}{r} -42x^2 \\ -42x + 1x \\ \hline \end{array}$ $6x^2 - 42x + 1x - 7$ $6x(x-7) + 1(x-7)$ $(x-7)(6x+1) = 0$ $x-7=0 \quad 6x+1=0$ $x=7 \quad x=-\frac{1}{6}$ $\{7, -\frac{1}{6}\}$

**** OR Slide, Divide**

$$5x^2 - 3x - 2 = 0$$

$$x^2 - 3x - 10 = 0$$

$$(x-5)(x+2) = 0$$

$$(x-\frac{5}{5})(x+\frac{2}{5}) = 0$$

$$(x-1)(x+\frac{2}{5}) = 0$$

S.D.B.U.

$$x^2 - 41x - 42 = 0$$

$$(x - \frac{42}{6})(x + \frac{1}{6}) = 0$$

$$(x-7)(x+\frac{1}{6}) = 0$$

Part II: Solve by taking square roots. If necessary, leave answers in fraction form and simplified radicals.

13. $25x^2 + 11 = 60$ $\begin{array}{r} -11 \quad -11 \\ 25x^2 = 49 \\ 25 \quad 25 \\ \hline x^2 = \frac{49}{25} \end{array}$ $\sqrt{x^2} = \sqrt{\frac{49}{25}}$ $\boxed{\pm \frac{7}{5}}$	14. $9x^2 - 3 = 22$ $\begin{array}{r} +3 \quad +3 \\ 9x^2 = 25 \\ 9 \quad 9 \\ \hline x^2 = \frac{25}{9} \end{array}$ $\sqrt{x^2} = \sqrt{\frac{25}{9}}$ $\boxed{x = \pm \frac{5}{3}}$
15. $x^2 - 13 = 0$ $\begin{array}{r} +13 \quad +13 \\ x^2 = 13 \end{array}$ $\sqrt{x^2} = \sqrt{13}$ $x = \boxed{\pm \sqrt{13}}$	16. $5x^2 = 160$ $\begin{array}{r} \div 5 \quad \div 5 \\ x^2 = 32 \end{array}$ $x = \pm \sqrt{32}$ (simplify!) $2 \times 16 = 32$ $\sqrt{16 \cdot 2} = 4\sqrt{2}$ $\boxed{\pm 4\sqrt{2}}$
17. $x^2 - 5 = 15$ $\sqrt{x^2} = \sqrt{20}$ $x = \pm \sqrt{20}$ $20 = 4 \times 5$ $\boxed{\pm 2\sqrt{5}}$	18. $(x - 5)^2 = 16$ $\sqrt{(x-5)^2} = \sqrt{16}$ $x - 5 = \pm 4$ $\begin{array}{r} +5 \quad +5 \\ x = \pm 4 + 5 \end{array}$ $\begin{array}{l} 5 + 4 = 9 \\ 5 - 4 = 1 \end{array}$ $\boxed{\{9, 1\}}$
19. $4(2x - 5)^2 = 16$ $\begin{array}{r} \div 4 \quad \div 4 \\ (2x-5)^2 = 4 \end{array}$ $\sqrt{(2x-5)^2} = \sqrt{4}$ $2x - 5 = \pm 2$ $\left\{ \frac{7}{2}, \frac{3}{2} \right\}$	20. $-5(x + 2)^2 = 40$ $\begin{array}{r} \div -5 \quad \div -5 \\ (x+2)^2 = -8 \end{array}$ no real solution!

$$2x - 5 = \pm 2$$

$$\begin{array}{r} 2x - 5 = 2 \\ +5 \quad +5 \\ \hline 2x = 7 \\ \frac{2x}{2} = \frac{7}{2} \end{array} \quad \begin{array}{r} 2x - 5 = -2 \\ +5 \quad +5 \\ \hline 2x = 3 \\ \frac{2x}{2} = \frac{3}{2} \end{array}$$

$$\boxed{\frac{7}{2}, \frac{3}{2}}$$