

Use the following to review for your test. Work the Practice Problems on a separate sheet of paper.

Omit 15, 16, 19, 20

You need to know & be able to do	Things to remember	Example Problems	
Solve a Quadratic by Factoring	Get in standard form.	*DOTS*	
	Factor. Set each factor equal to zero and solve. $\frac{4}{2 \ 2} \quad \frac{15}{3 \ 5}$	1. $4x^2 - 9 = 0$ $(2x+3)(2x-3) = 0$ $x = \frac{-2}{3} \quad x = \frac{2}{3}$	2. $2x^2 + x - 6 = 0$ $(2x-3)(x+2) = 0$ $x = \frac{3}{2} \quad x = -2$
Solve a Quadratic by Taking Square Roots	Isolate the square. Take the square root of both sides.	3. $-4x^2 = -4x - 15$ $0 = 4x^2 - 4x - 15$ $(2x+3)(2x-5) = 0$ $x = -\frac{3}{2} \quad x = \frac{5}{2}$	4. $5x^2 + x - 4 = 0$ $(5x-4)(x+1) = 0$ $x = \frac{4}{5} \quad x = -1$
	Don't forget the \pm . Get the variable by itself.	5. $x^2 + 13 = 0$ $\sqrt{x^2} = \sqrt{-13}$ no real solutions	6. $\frac{3(x^2-1)}{3} = \frac{27}{3}$ $x^2 - 1 = 9$ $\sqrt{x^2} = \sqrt{10}$ $x = \pm\sqrt{10}$
Solve a Quadratic by Completing the Square	Put terms with an x on the left. Find the number that completes the square. Add it to both sides.	7. $2(x-1)^2 + 4 = 16$ $\frac{2(x-1)^2}{2} = \frac{12}{2}$ $\sqrt{(x-1)^2} = \sqrt{6}$ $x-1 = \pm\sqrt{6}$ $x = 1 \pm\sqrt{6}$	8. $\sqrt{(x+4)^2} = \sqrt{121}$ $x+4 = \pm 11$ $x = -4 \pm 11$ $x = -4+11 \quad x = -4-11$ $x = 7 \quad x = -15$
	Factor the left. Simplify the right. Take the square root of each side. Solve for x.	9. $x^2 + 2x - 4 = 0$ $x^2 + 2x + 1 = 4 + 1$ $\sqrt{(x+1)^2} = \sqrt{5}$ $x+1 = \pm\sqrt{5}$ $x = -1 \pm\sqrt{5}$	10. $x^2 + 8x + 4 = 0$ $x^2 + 8x + 16 = -4 + 16$ $\sqrt{(x+4)^2} = \sqrt{12}$ $x+4 = \pm 2\sqrt{3}$ $x = -4 \pm 2\sqrt{3}$
		11. $x^2 - 8x + 36 = 0$ $x^2 - 8x + 16 = -36 + 16$ $x^2 - 8x + 16 = -20$ $\sqrt{(x-4)^2} = \sqrt{-20}$ no real solutions	12. $\frac{3x^2 + 12x - 6 = 0}{3}$ $x^2 + 4x - 2 = 0$ $x^2 + 4x + 4 = 2 + 4$ $(x+2)^2 = 2 + 4$ $\sqrt{(x+2)^2} = \sqrt{6}$ $x+2 = \pm\sqrt{6}$ $x = -2 \pm\sqrt{6}$

Solve by Completing the square		<p>13. $x^2 + 4x - 2 = 0$</p> $x^2 + 4x + 4 = 2 + 4$ $(x+2)^2 = 6$ $x = -2 \pm \sqrt{6}$	<p>14. $x^2 + 4x - 1 = 0$</p> $x^2 + 4x + 4 = 1 + 4$ $\sqrt{(x+2)^2} = \sqrt{5}$ $x+2 = \pm \sqrt{5}$ $x = -2 \pm \sqrt{5}$
	<p>15. $6x^2 - 5x = -2$</p> <p>Omit 15 & 16</p>	<p>16. $2x^2 + 2x = 4x - 1$</p> <p>NO roots</p> $2x^2 - 2x = -1$ $2(x^2 - x) = -1$ $2(x^2 - x + \frac{1}{4}) = -1 + \frac{1}{2}$ $2(x^2 - x + \frac{1}{4}) = -\frac{1}{2}$ $2(x - \frac{1}{2})^2 = -\frac{1}{2}$ $(x - \frac{1}{2})^2 = -1$ 	
Solve by Any Method		<p>17. $x^2 + 8x + 16 = 0$</p> $(x+4)(x+4) = 0$ $x = -4 \quad x = -4$	<p>18. $2x^2 + 5x - 3 = 0$</p> $(2x-1)(x+3) = 0$ $x = \frac{1}{2} \quad x = -3$
	<p>omit 19 needs</p>	<p>19. $x^2 + 5x + 9 = 0$</p> $x^2 + 5x + 6.25 = 9 + 6.25$ $(x + 2\frac{1}{2})^2 = 15\frac{1}{4}$ $x + 2\frac{1}{2} = \sqrt{15\frac{1}{4}}$ $x = -2\frac{1}{2} \pm \sqrt{15\frac{1}{4}}$ 	<p>20. $2x^2 + 5x + 7 = 0$</p> $(2x \quad x \quad 1)$ <p>omit 20</p> <p>needs Quad Formula</p>
	<p>Quad formula</p>	<p>21. $3x^2 + 10x = 8$</p> $3x^2 + 10x - 8 = 0$ $(3x-2)(x+4) = 0$ $x = \frac{2}{3} \quad x = -4$	<p>22. $4x^2 - 100 = 0$</p> $(2x+10)(2x-10) = 0$ $x = -5 \quad x = 5$ <p>or GCF First</p> $4(x^2 - 25) = 0$ $4(x+5)(x-5) = 0$

~~x~~ = -5 x = 5

$$\textcircled{1} \quad 5x^2 + 18x + 9 = 0$$

$$\text{Factors} \quad \overbrace{(5x+3)}^{3x} \overbrace{(x+3)}^{15x} = 0$$

$$\text{Solve:} \quad 5x+3=0 \quad x+3=0$$

$$5x=-3 \quad \boxed{x=-3}$$

$$\boxed{x=-3/5}$$

$$\textcircled{2} \quad x^2 - 20 = 8x \quad \text{\# could use CTS}$$

$$x^2 - 8x - 20 = 0$$

$$(x-10)(x+2) = 0$$

$$(x-10)=0 \quad (x+2)=0$$

$$\boxed{x=10} \quad \boxed{x=-2}$$

$$\textcircled{3} \quad 2x^2 + 5x - 3 = 0$$

$$(2x-1)(x+3) = 0$$

$$2x-1=0 \quad x+3=0$$

$$2x=1 \quad \boxed{x=-3}$$

$$\boxed{x=1/2}$$

Solve BY square roots

$$\textcircled{4} \quad \frac{1}{7}x^2 - 3 = 4$$

$$+3 \quad +3$$

$$7 \cdot \frac{1}{7}x^2 = 7 \cdot 7$$

$$x^2 = 49$$

$$\sqrt{x^2} = \sqrt{49}$$

$$x = \pm 7$$

$$\textcircled{5} \quad 5(x-4)^2 = 125$$

$$\frac{5(x-4)^2}{5} = \frac{125}{5}$$

$$(x-4)^2 = 25$$

$$\sqrt{(x-4)^2} = \sqrt{25}$$

$$x-4 = \pm 5$$

$$+4 \quad +4$$

$$x = 4 \pm 5$$

$$x = 4+5$$

$$\boxed{x=9}$$

$$x = 4-5$$

$$\boxed{x=-1}$$

$$\textcircled{6} \quad 2(x-5)^2 + 2 = 10$$

$$-2 \quad -2$$

$$2(x-5)^2 = 8$$

$$\sqrt{2(x-5)^2} = \sqrt{4}$$

$$x-5 = \pm 2$$

$$x = 5 \pm 2$$

$$\boxed{x=7}$$

$$\boxed{x=3}$$

$$\begin{aligned} (14) \quad (x+6)^2 - 8 &= 16 \\ (x+6)^2 &= 24 \\ x+6 &= \pm 2\sqrt{6} \\ \boxed{x &= -6 \pm 2\sqrt{6}} \end{aligned}$$

Special Case #

ANY Method

$$(15) \quad x^2 - 81 = 0$$

$$\begin{aligned} (x-9)(x+9) &= 0 \\ x &= 9 \quad x = -9 \end{aligned}$$

Factoring:

OR
By Square
Roots

$$\begin{aligned} x^2 - 81 &= 0 \\ \sqrt{x^2} &= \sqrt{81} \\ \boxed{x &= \pm 9} \end{aligned}$$

$$\begin{aligned} (16) \quad 2x^2 + 11x + 5 &= 0 \\ (2x + 1)(x + 5) &= \end{aligned}$$

$$x = -\frac{1}{2} \quad x = -5$$

$$\begin{aligned} (17) \quad x^2 - 14x + 45 &= 0 \\ (x-9)(x-5) &= 0 \\ x &= 9 \quad x = 5 \end{aligned}$$

Factor:

or

CTS

$$\begin{aligned} x^2 - 14x + \underline{49} &= -45 + \underline{49} \\ \sqrt{(x-7)^2} &= \sqrt{4} \\ x-7 &= \pm 2 \\ x &= 7 \pm 2 \end{aligned}$$

$$\boxed{x = 9} \quad \boxed{x = 5}$$

$$\begin{aligned} (18) \quad 25x^2 + 10x - 3 &= 0 \\ (5x+3)(5x-1) &= 0 \\ x &= -\frac{3}{5} \quad x = \frac{1}{5} \end{aligned}$$

$$\begin{aligned} (19) \quad (x-2)^2 - 7 &= 3 \\ \sqrt{(x-2)^2} &= \sqrt{10} \\ x-2 &= \pm \sqrt{10} \\ x &= 2 \pm \sqrt{10} \end{aligned}$$

$$\begin{aligned} (20) \quad 3x^2 &= -18x - 12 \\ 3x^2 - 18x + 12 &= 0 \end{aligned}$$

$$\frac{3(x^2 - 6x + 4)}{3} = \frac{0}{3}$$

$$x^2 - 6x + 4 = 0$$

$$x^2 - 6x + \frac{9}{9} = -4 + \frac{9}{9}$$

$$\begin{aligned} x^2 - 6x + 9 &= 5 \\ \sqrt{(x-3)^2} &= \sqrt{5} \end{aligned}$$

$$x-3 = \pm \sqrt{5}$$

$$\boxed{x = 3 \pm \sqrt{5}}$$

CTS

$$(7) \quad x^2 + 6x = 27$$

$$x^2 + 6x + \underline{\quad} = 27 + \underline{\quad}$$

$$x^2 + 6x + 9 = 27 + 9$$

$$x^2 + 6x + 9 = 36$$

$$\sqrt{(x+3)^2} = \sqrt{36}$$

$$x+3 = \pm 6$$

$$x = -3 \pm 6$$

$$\boxed{x = -9} \quad \boxed{x = +3}$$

$$(8) \quad x^2 + 4x - 6 = 0$$

$$x^2 + 4x + \underline{4} = 6 + \underline{4}$$

$$\sqrt{(x+2)^2} = \pm\sqrt{10}$$

$$x+2 = \pm\sqrt{10}$$

$$\boxed{x = -2 \pm \sqrt{10}}$$

$$(9) \quad \frac{3x^2 - 24x}{3} = \frac{27}{3}$$

$$x^2 - 8x = 9$$

$$x^2 - 8x + \underline{16} = 9 + \underline{16}$$

$$\sqrt{(x-4)^2} = \sqrt{25}$$

$$x-4 = \pm 5$$

$$x = 4 \pm 5$$

$$\boxed{x = 9} \quad \boxed{x = -1}$$

FACTORING

$$(10) \quad \begin{array}{r} 2x^2 + 7x = 10x - 2 \\ -10x \quad -10x \end{array}$$

$$2x^2 - 3x = +2$$

$$+2 \quad +2$$

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

$$(2x+1)(x-2) = 0$$

$$2x+1 = 0$$

$$\boxed{x = 2}$$

$$2x = -1$$

$$\boxed{x = -\frac{1}{2}}$$

$$x^2 - 6x = 16$$

$$(11) \quad x^2 - 6x - 16 = 0$$

$$(x+2)(x-8) = 0$$

$$\boxed{x = -2}$$

$$\boxed{x = 8}$$

Any Method

$$(12) \quad x^2 - 6x = 40$$

$$x^2 - 6x - 40 = 0$$

$$(x-10)(x+4) = 0$$

$$\boxed{x = 10}$$

$$\boxed{x = -4}$$

$$(13) \quad 7x^2 + 12x + 5 = 0$$

$$(7x+5)(x+1) = 0$$

$$7x+5 = 0$$

$$x+1 = 0$$

$$7x = -5$$

$$\boxed{x = -\frac{5}{7}}$$

$$\boxed{x = -1}$$

$$(21) \quad 5x^2 + 25x = 0$$

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

$$5x = 0$$

$$\boxed{x = 0}$$

$$x+5 = 0$$

$$\boxed{x = -5}$$

$$3x^2 + 8x = 11$$

$$(22) \quad 3x^2 + 8x - 11 = 0$$

$$(3x + 11)(x - 1) = 0$$

$$3x - 1 = 0$$

$$3x = 1$$

$$\boxed{x = \frac{1}{3}}$$

$$\boxed{x = -11}$$

$$x^2 = 6x + 5$$

$$(23) \quad x^2 - 6x = 5$$

$$x^2 - 6x + \underline{9} = 5 + \underline{9}$$

$$(x-3)^2 = 14$$

$$x-3 = \pm\sqrt{14}$$

$$\boxed{x = 3 \pm \sqrt{14}}$$

Name:

Quiz: Solving Quadratics

10/5

standard form: $ax^2 + bx + c = 0$

Solve By Factoring. Remember to check for a GCF first.

① $n^2 - 5n - 24 = 0$
 $(n-8)(n+3) = 0$
 $n=8$ $n=-3$

② $3r^2 - 20r + 32 = 0$
 $(3r-8)(r-4) = 0$
 $3r-8=0$ $r-4=0$
 $r=8/3$ $r=4$

GCF

③ $3x^2 - x = 0$

④ $3x^2 + 9x - 54 = 0$

$(3x^2 - x) = 0$

$3(x^2 + 3x - 18) = 0$

$x(3x-1) = 0$

$3(x+6)(x-3) = 0$

$x=0$

$3x-1=0$

$x=1/3$

$x=-6$ $x=3$

$3x^2 - 14x + 15 = 0$

⑤ $2x^2 + x - 15 = 0$
 $(2x-5)(x+3) = 0$

⑥ $3x^2 - 14x + 18 = 0$
 $(3x+1)(x-5) = 0$

$x=5/2$ $x=-3$

$x=-1/3$

$x=5$

Solve using the square roots method.

⑦ $\sqrt{(x+4)^2} = \sqrt{121}$
 $x+4 = \pm 11$
 $x = -4 \pm 11$
 $x = -15$ $x = 7$

⑧ $(2x+6)^2 - 8 = 24$
 $+8$ $+8$
 $\sqrt{(2x+6)^2} = \sqrt{32}$
 $2x+6 = \pm 4\sqrt{2}$
 $2x = -6 \pm 4\sqrt{2}$
 $x = \frac{-6 \pm 4\sqrt{2}}{2}$
 $x = -3 \pm 2\sqrt{2}$

⑨ $3x^2 - 7 = 54$
 $+7$ $+7$
 $\frac{3x^2}{3} = \frac{61}{3}$
 $x^2 = \frac{61}{3}$
 $x = \pm \sqrt{\frac{61}{3}}$

⑩ $2x^2 - 10 = -x^2 - 1$
 $+x^2$ $+10$ $+x^2$ $+10$
 $\frac{3x^2}{3} = \frac{9}{3}$
 $x^2 = 3$
 $x = \pm \sqrt{3}$