

Name: _____

8A; Algebra 1

Date: _____

Period _____

Review For Quadratics I Test

1) Solve the following equations:

Check:

(a) $x^2 - 11x + 18 = 0$

(b) $y^2 - 36 = 0$

(c) $x^2 - 2x = 15$

(d) $2k^2 + 5k + 3 = 3$

(e) $w(w + 7) = 18$

(f) $\frac{x+5}{3} = \frac{10}{x-8}$

(g) $x^2 - 7x = 0$

(h) $5x^2 = 15x$

2) What is the positive root of $m^2 = 16 - 6m$?

3) Solve for x in simplest radical form: $2x^2 - 36 = 0$

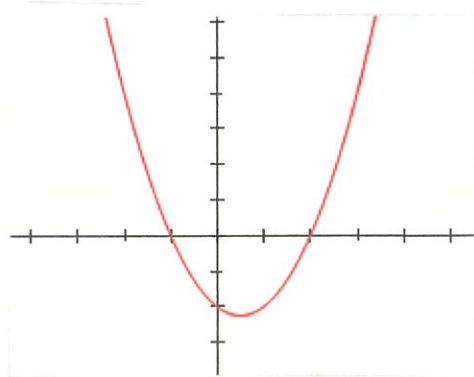
4) Find the smaller root of $(x + 8)(x + 6) = 0$.

5) Find the larger root of $x(x + 9) = 0$

6) Find the roots of the equation $w^2 = 52$.

7) Solve for x : $\frac{3x+5}{2} = \frac{x^2}{2x}$

8) What is the equation for the following graph?



* For 9 & 10: Solve the following word problems using Legend, Equation, Solution, and Check

9) The square of a positive number is 6 more than 5 times the number. Find the number.

10) A rectangle has an area of 70. If the sides of the rectangle are represented by x and $3x - 1$, find the lengths of these sides.

11) What are the values of x that satisfy the following equation? $6x^2 + 11x - 10 = 0$

Simplify the following

12) $\sqrt{8}$

13) $\sqrt{\frac{a^2}{8}}$

14) $\sqrt{\frac{3}{5}}$

15) $\sqrt{2\frac{2}{5}}$

16) $\frac{8\sqrt{32}}{\sqrt{50}}$

17) $\frac{3}{4}\sqrt{20a^6}$

18) $\sqrt{54a^2b^9}$

19) $\sqrt{\frac{x}{15}}$

Review For Quadratics I Test

1) Solve the following equations:

(a) $x^2 - 11x + 18 = 0$ → 2 answers

$(x-9)(x-2) = 0$	
$x-9=0$ +9 +9	$x-2=0$ +2 +2
$x=9$	$x=2$

• Roots
• solutions
• zeros

$\{2, 9\}$

Check:

chk #1
 $x=2$
 $x^2 - 11x + 18 = 0$
 $(2)^2 - 11(2) + 18 = 0$
 $4 - 22 + 18 = 0$
 $0 = 0$
✓

chk #2
 $x=9$
 $x^2 - 11x + 18 = 0$
 $(9)^2 - 11(9) + 18 = 0$
 $81 - 99 + 18 = 0$
 $0 = 0$
✓

(b) $y^2 - 36 = 0$ → 2 answers

$+36 +36$
 $\sqrt{y^2} = \sqrt{36}$
 $y = \pm 6$
 $\{-6, 6\}$

(c) $x^2 - 2x = 15$

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

$(x-5)(x+3) = 0$

$x-5=0$ +5 +5	$x+3=0$ -3 -3
$x=5$	$x=-3$

$\{-3, 5\}$

(d) $2k^2 + 5k + 3 = 3$

$-3 +3$
 $2k^2 + 5k = 0$

$k(2k+5) = 0$

$k=0$	$2k+5=0$ -5 -5
	$\frac{2k}{2} = \frac{-5}{2}$
	$k = -2\frac{1}{2}$

$\{0, -2\frac{1}{2}\}$

(e) $w(w+7) = 18$

$w^2 + 7w = 18$
 $-18 -18$

$w^2 + 7w - 18 = 0$
 $(w+9)(w-2) = 0$

$w+9=0$ -9 -9	$w-2=0$ +2 +2
$w=-9$	$w=2$

$\{-9, 2\}$

(f) $\frac{x+5}{3} = \frac{10}{x-8}$

$(x+5)(x-8) = 30$
 $x^2 - 8x + 5x - 40 = 30$
 $x^2 - 3x - 40 = 30$
 $-30 -30$

$x^2 - 3x - 70 = 0$

$(x-10)(x+7) = 0$

$x-10=0$ +10 +10	$x+7=0$ -7 -7
$x=10$	$x=-7$

$\{-7, 10\}$

(g) $x^2 - 7x = 0$

$x(x-7) = 0$

$x=0$	$x-7=0$ +7 +7
	$x=7$

$\{0, 7\}$

(h) $5x^2 = 15x$

$-15x +15x$
 $5x^2 - 15x = 0$

$5x(x-3) = 0$

$5x=0$ $\frac{5x}{5} \frac{0}{5}$	$x-3=0$ +3 +3
$x=0$	$x=3$

2) What is the positive root of $m^2 = 16 - 6m$?

$-16 + 6m + 16 + 6m$

$m^2 + 6m - 16 = 0$

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

$m+8=0$ -8 -8	$m-2=0$ +2 +2
$m=-8$	$m=2$

$\{2\}$

3) Solve for x in simplest radical form: $2x^2 - 36 = 0$

algebraically
you must have
a radical in your
answer

$$\begin{aligned} 2x^2 - 36 &= 0 \\ +36 &+36 \\ \hline 2x^2 &= 36 \\ \frac{2x^2}{2} &= \frac{36}{2} \\ \sqrt{x^2} &= \sqrt{18} \\ \sqrt{9 \cdot 2} & \\ 3\sqrt{2} & \\ \hline x &= \pm 3\sqrt{2} \end{aligned}$$

4) Find the smaller root of $(x+8)(x+6) = 0$.

answer

$x+8=0$ $-8-8$	$x+6=0$ $-6-6$	$\{-8\}$
$x=-8$	$x=-6$	

5) Find the larger root of $x(x+9) = 0$

$x=0$	$x+9=0$ $-9-9$ $x=-9$	$\{0\}$
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6) Find the roots of the equation $w^2 = 52$.

$$\begin{aligned} \sqrt{4 \cdot 13} \\ 2\sqrt{13} \end{aligned}$$

$$w = \pm 2\sqrt{13}$$

7) Solve for x: $\frac{3x+5}{2} = \frac{x^2}{2x}$ $(x \neq 0)$

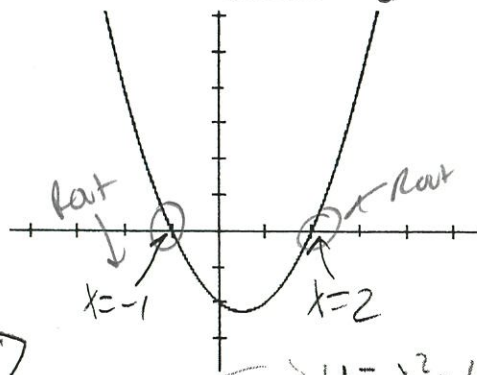
$$\begin{aligned} 2x(3x+5) &= 2x^2 \\ 6x^2 + 10x &= 2x^2 \\ -2x^2 & \quad -2x^2 \\ \hline 4x^2 + 10x & \end{aligned}$$

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

$\frac{2x}{2} = 0$ $x = 0$	$2x+5=0$ $-5-5$ $\frac{2x}{2} = -5$ $x = -2\frac{1}{2}$
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Reject
denom can't
be zero
10 can't
be zero

8) What is the equation for the following graph? $y = \text{or } f(x) = 0$



$$\{-2\frac{1}{2}\}$$

work backwards

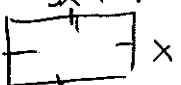
$$\begin{aligned} x^2 - 1x - 2 &= 0 & y &= x^2 - 1x - 2 \\ x^2 - 2x + 1x - 2 &= 0 & \text{or} & \\ (x+1)(x-2) &= 0 & f(x) &= x^2 - 1x - 2 \end{aligned}$$

* Solve the following word problems using Legend, Equation, Solution, and Check

9) The square of a positive number is 6 more than 5 times the number. Find the number.

L	E	S	C						
let $x =$ the #	$x^2 = 5x + 6$ $\begin{array}{r} x^2 = 5x + 6 \\ -5x - 6 \quad \cancel{5x} - 6 \\ \hline x^2 - 5x - 6 = 0 \end{array}$ $(x-6)(x+1) = 0$ <table border="0"> <tr> <td>$x-6=0$</td> <td>$x+1=0$</td> </tr> <tr> <td>$+6 \quad +6$</td> <td>$-1 \quad -1$</td> </tr> <tr> <td>$x=6$</td> <td>$x=-1$</td> </tr> </table> Reject NOT positive	$x-6=0$	$x+1=0$	$+6 \quad +6$	$-1 \quad -1$	$x=6$	$x=-1$	The positive number is 6	$(6)^2 = 36$ $5(6) = 30$ ✓ $30 + 6 = 36$
$x-6=0$	$x+1=0$								
$+6 \quad +6$	$-1 \quad -1$								
$x=6$	$x=-1$								

10) A rectangle has an area of 70. If the sides of the rectangle are represented by x and $3x - 1$, find the lengths of these sides.

L	E	S	C								
Let $x =$ width of the rectangle $3x-1 =$ length of the rectangle  $A = L \cdot w$	$x(3x-1) = 70$ $3x^2 - x = 70$ $\begin{array}{r} 3x^2 - x = 70 \\ -70 \quad -70 \\ \hline 3x^2 - x - 70 = 0 \end{array}$ $(3x-15)(x+14) = 0$ $\frac{3}{3} \quad \frac{1}{3}$ $(x-5)(3x+14) = 0$ <table border="0"> <tr> <td>$x-5=0$</td> <td>$3x+14=0$</td> </tr> <tr> <td>$+5 \quad +5$</td> <td>$-14 \quad -14$</td> </tr> <tr> <td>$x=5$</td> <td>$3x=-14$</td> </tr> <tr> <td>$3x+1=14$</td> <td>$3x=-15$</td> </tr> </table> Reject can't have negative dimensions	$x-5=0$	$3x+14=0$	$+5 \quad +5$	$-14 \quad -14$	$x=5$	$3x=-14$	$3x+1=14$	$3x=-15$	The width of the rectangle is 5 and the length of the rectangle is 14	$14 \times 5 = 70$ ✓
$x-5=0$	$3x+14=0$										
$+5 \quad +5$	$-14 \quad -14$										
$x=5$	$3x=-14$										
$3x+1=14$	$3x=-15$										

11) What are the values of x that satisfy the following equation? $6x^2 + 11x - 10 = 0$

★ Tricky Tri ★

$$(6x + 15) \left(\frac{6x-4}{2} \right) = 0$$

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

$2x + 5 = 0$	$3x - 2 = 0$
$-5 \quad -5$	$+2 \quad +2$
$2x = -5$	$\frac{3x}{3} = \frac{2}{3}$
$\frac{2x}{2} = \frac{-5}{2}$	$x = \frac{2}{3}$
$x = -2\frac{1}{2}$	

$$\left\{ -2\frac{1}{2}, \frac{2}{3} \right\}$$

★ NO ± B/c you are simplifying not solving.

Simplify the following

$$12) \sqrt{8} = \sqrt{4 \cdot 2} = 2\sqrt{2}$$

plus & minus

$$13) \sqrt{\frac{a^2}{8}} = \frac{\sqrt{a^2}}{\sqrt{8}} = \frac{\sqrt{8}}{\sqrt{8}} = \frac{\sqrt{8a^2}}{\sqrt{64}}$$

NUM $\sqrt{8a^2}$ $\sqrt{4 \cdot 2} \cdot a$ $2\sqrt{2} \cdot a$ $2a\sqrt{2}$	DENOM $\sqrt{64}$ 8	$\frac{2a\sqrt{2}}{8} = \frac{a\sqrt{2}}{4}$
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$$14) \sqrt{\frac{3}{5}} = \frac{\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{15}}{\sqrt{25}} = \frac{\sqrt{15}}{5}$$

NUM 15	DENOM 25	$\frac{\sqrt{15}}{5}$
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$$15) \sqrt{\frac{2}{5}} = \frac{\sqrt{2}}{\sqrt{5}} = \frac{\sqrt{2} \cdot \sqrt{5}}{\sqrt{5} \cdot \sqrt{5}} = \frac{\sqrt{10}}{5}$$

NUM $\sqrt{10}$ $\sqrt{4} \cdot \sqrt{5}$ 2√10	DENOM 25	$\frac{2\sqrt{10}}{5}$
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$$16) \frac{8\sqrt{32}}{\sqrt{50}} = \frac{8\sqrt{1600}}{\sqrt{2500}} = \frac{8 \cdot 40}{50} = \frac{320}{50} = 6\frac{2}{5}$$

NUM 8√1600 ↓ 8 · 40 320	DENOM √2500 50	$6\frac{2}{5}$
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for even take 1/2 of the exponent

$$17) \frac{3}{4} \sqrt[4]{20a^6} = \frac{3}{4} \sqrt[4]{4 \cdot 5 \cdot a^4 \cdot a^2} = \frac{3}{4} \cdot \sqrt[4]{4} \cdot \sqrt[4]{5} \cdot \sqrt[4]{a^4} \cdot \sqrt[4]{a^2} = \frac{3}{4} \cdot 2 \cdot \sqrt[4]{5} \cdot a \cdot \sqrt[4]{a^2} = \frac{3}{2} a \sqrt[4]{5a^2} = 1\frac{1}{2} a \sqrt[4]{5a^2}$$

$$18) \sqrt{54a^2b^9} = \sqrt{9 \cdot 6 \cdot a^2 \cdot b^8 \cdot b} = 3\sqrt{6} \cdot a \cdot b^4 \sqrt{b} = 3ab^4\sqrt{6b}$$

exponents must add to exponent in the radical

$$19) \sqrt{\frac{x}{15}} = \frac{\sqrt{x}}{\sqrt{15}} = \frac{\sqrt{x} \cdot \sqrt{15}}{\sqrt{15} \cdot \sqrt{15}} = \frac{\sqrt{15x}}{15}$$

NUM √15x	DENOM √225 15	$\frac{\sqrt{15x}}{15}$
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