

Name: KEY

Date:

Section: 2010-2011

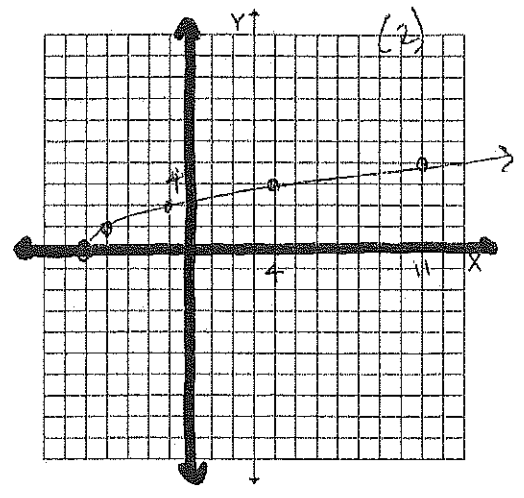
Algebra B

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Mini-Quiz 11.1. Graph Square Root Functions.

Graph the following square root functions, state the domain and range, and compare it to the parent square root function.

(1)  $y = \sqrt{x+5}$



(2)

	0	1	4	9	16
x	-5	-4	-1	4	11
y	0	1	2	3	4

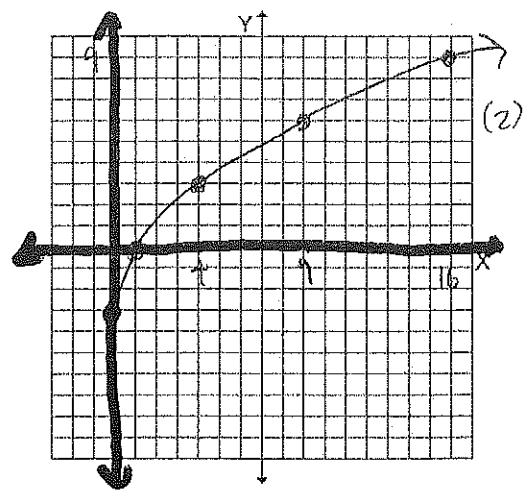
(i) Domain:  $x \geq -5$

(ii) Range:  $y \geq 0$

Comparison to  $y = \sqrt{x}$  (parent):

(1) 1. Horiz. Translation LEFT 5

(2)  $y = 3\sqrt{x-3}$



(2)

	0	1	4	9	16
x	3	4	7	12	19
y	0	3	6	9	12

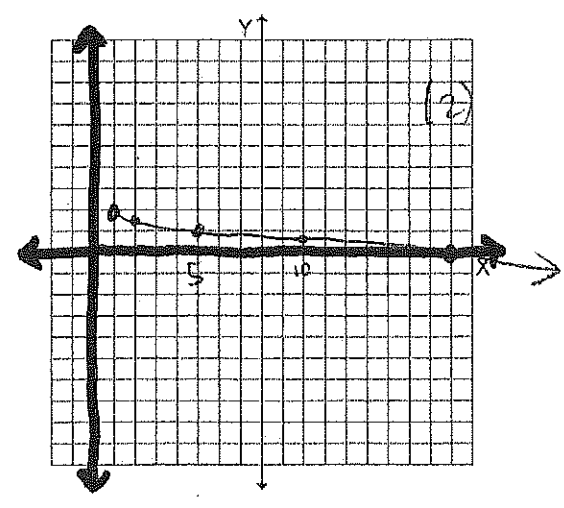
(i) Domain:  $x \geq 3$

(ii) Range:  $y \geq 0$

Comparison to  $y = \sqrt{x}$  (parent):

(2) 1. Vert. stretch BAFO 3  
2. Vert. translation DOWN 3

(3)  $y = -\frac{1}{2}\sqrt{x-1} + 2$



(2)

	0	1	4	9	16
x	1	2	5	10	17
y	2	1.5	1	0.5	0

(i) Domain:  $x \geq 1$

(ii) Range:  $y \leq 2$

Comparison to  $y = \sqrt{x}$  (parent):

(4) 1. REFLECTION OVER x-axis  
2. Vert. SHRINK BAFO 1/2  
3. Horiz. Translation RIGHT 1  
4. Vert. Translation

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## Mini-Quiz 11.2. Simplify Radical Expressions.

Simplify the following radical expressions. Remember, your final answer needs to be in simplest form!

1.  $\sqrt{90}$

$$\sqrt{9}\sqrt{10}$$

$$\boxed{3\sqrt{10}}$$

2.  $\sqrt{6x^3y^3z} \cdot \sqrt{3yz}$

$$\sqrt{18x^4y^4z^2}$$

$$\sqrt{9}\sqrt{2}\sqrt{x^4}\sqrt{y^4}\sqrt{z^2}$$

$$\boxed{3x^2y^2z\sqrt{2x}}$$

3.  $\sqrt{\frac{27}{4}}$

$$\frac{\sqrt{27}}{\sqrt{4}} = \frac{3\sqrt{3}}{2}$$

4.  $\sqrt{125} + 2\sqrt{5}$

$$5\sqrt{5} + 2\sqrt{5}$$

$$\boxed{7\sqrt{5}}$$

5.  $\frac{4}{\sqrt{3}} - \frac{3}{\sqrt{27}}$

$$\frac{3 \cdot 4}{3\sqrt{3}} - \frac{3}{3\sqrt{3}}$$

or

$$\frac{4}{\sqrt{3}} - \frac{1}{\sqrt{3}} = \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$$

$$\frac{12}{3\sqrt{3}} - \frac{3}{3\sqrt{3}} = \frac{9}{3\sqrt{3}} = \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \boxed{\sqrt{3}}$$

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## Mini-Quiz 11.3. Solve Radical Equations.

Solve the following radical equations. Check for extraneous solutions.

$$1. \quad 10\sqrt{x} - 90 = 0$$

$$\quad \quad \quad +90 \quad +90$$

$$\frac{10\sqrt{x}}{10} = \frac{90}{10}$$

$$\sqrt{x} = 9$$

$$x = 81$$

✓
$10\sqrt{81} - 90 = 0$
$10 \cdot 9 - 90 = 0$
$90 - 90 = 0$
$0 = 0$

$$2. \quad 3\sqrt{4x} + 15 = 3$$

$$\quad \quad \quad -15 \quad -15$$

$$\frac{3\sqrt{4x}}{3} = \frac{-12}{3}$$

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

$$4x = 16$$

$$x = 4$$

extraneous

✓
$3\sqrt{4(4)} + 15 = 3$
$3\sqrt{16} + 15 = 3$
$12 + 15 = 3$
$27 = 3$

NO Real Solutions

$$3. \quad (x)^2 = (\sqrt{20-x})^2$$

$$x^2 = 20 - x$$

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

$$(x+5)(x-4) = 0$$

$$x = -5, 4$$

extraneous

$$x = 4$$

$$4. \quad \sqrt{2x+11} - \sqrt{x+8} = 0$$

$$\quad \quad \quad +\sqrt{x+8} \quad +\sqrt{x+8}$$

$$(\sqrt{2x+11})^2 = (\sqrt{x+8})^2$$

$$2x+11 = x+8$$

$$-x \quad -11 \quad -x \quad -11$$

$$x = -3$$

✓
$\sqrt{2(-3)+11} - \sqrt{-3+8} = 0$
$\sqrt{5} - \sqrt{5} = 0$
$0 = 0$ ✓

$$-5 = \sqrt{20+5}$$

$$-5 = \sqrt{25}$$

$$\cancel{-5 = 5}$$

$$4 = \sqrt{20-4}$$

$$4 = \sqrt{16}$$

$$4 = 4 \quad \checkmark$$

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## Mini-Quiz 11.4. Pythagorean Theorem and its Converse.

Let  $a$  and  $b$  represent the lengths of the legs of a right triangle, and let  $c$  represent the length of the hypotenuse. Find the unknown length. Leave your answers in simplest radical form.

(1)  $a=7, b=24$

$$7^2 + 24^2 = c^2$$

$$49 + 576 = c^2$$

$$\sqrt{c^2} = \sqrt{625}$$

$$c = 25$$
  
UNITS

(2)  $a=5, c=7$

$$5^2 + b^2 = 7^2$$

$$25 + b^2 = 49$$

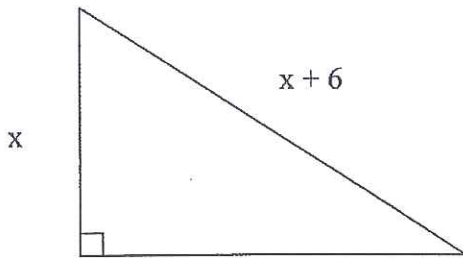
$$\sqrt{b^2} = \sqrt{24}$$

$$b = \sqrt{24} = \sqrt{4 \cdot 6}$$

$$b = 2\sqrt{6}$$
  
UNITS

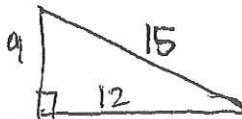
Find the unknown lengths.

(3)

 $x+3$ 

LEGS = 9, 12 UNITS

HYPOTENUSE = 15 UNITS



$$(x)^2 + (x+3)^2 = (x+6)^2$$

$$x^2 + \cancel{x^2} + 6x + 9 = x^2 + \cancel{12x} + \cancel{36}$$
  
$$-12x \quad -36 \quad -12x \quad -36$$

$$x^2 - 6x - 27 = 0$$

$$(x-9)(x+3) = 0$$

$$x = 9, \cancel{3}$$

Tell whether the triangle with the given side lengths is a right triangle.

(4) 18, 24, 30

$$18^2 + 24^2 \stackrel{?}{=} 30^2$$

$$324 + 576 \stackrel{?}{=} 900$$

$$900 \stackrel{?}{=} 900 \checkmark$$

RIGHT TRIANGLE

(5) 4, 8, 9

$$4^2 + 8^2 \stackrel{?}{=} 9^2$$

$$16 + 64 \stackrel{?}{=} 81$$

$$80 \neq 81$$

NOT A RIGHT TRIANGLE

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## Mini-Quiz 11.5. Distance and Midpoint Formulas.

Find the distance between the two points. Leave your answers in simplest radical form.

(3) (1) (2, 8) &amp; (7, -4)

$$d = \sqrt{(7-2)^2 + (-4-8)^2}$$

$$d = \sqrt{(5)^2 + (-12)^2}$$

$$d = \sqrt{25 + 144}$$

$$d = \sqrt{169}$$

$$d = 13$$
  
UNITS

(3) (2) (-1, -8) &amp; (5, -4)

$$d = \sqrt{(5-(-1))^2 + (-4-(-8))^2}$$

$$d = \sqrt{(6)^2 + (4)^2}$$

$$d = \sqrt{36 + 16}$$

$$d = \sqrt{52}$$

$$d = \sqrt{4} \sqrt{13}$$

$$d = 2\sqrt{13}$$
  
UNITS

Find the midpoint of the line segment with the given endpoints.

(3) (3) (10, -2) &amp; (16, -8)

$$M\left(\frac{10+16}{2}, \frac{-2+(-8)}{2}\right)$$

$$M\left(\frac{26}{2}, \frac{-10}{2}\right)$$

$$M(13, -5)$$

(3) (4) (5, -10) &amp; (5, 3)

$$M\left(\frac{5+5}{2}, \frac{-10+3}{2}\right)$$

$$M\left(\frac{10}{2}, \frac{-7}{2}\right)$$

$$M(5, -3.5)$$

