

Chapter 11. Final Exam Practice Questions.

Main topic #1: Graph square root functions

- (1) What are the important parts of a square root function that you need to consider when graphing?

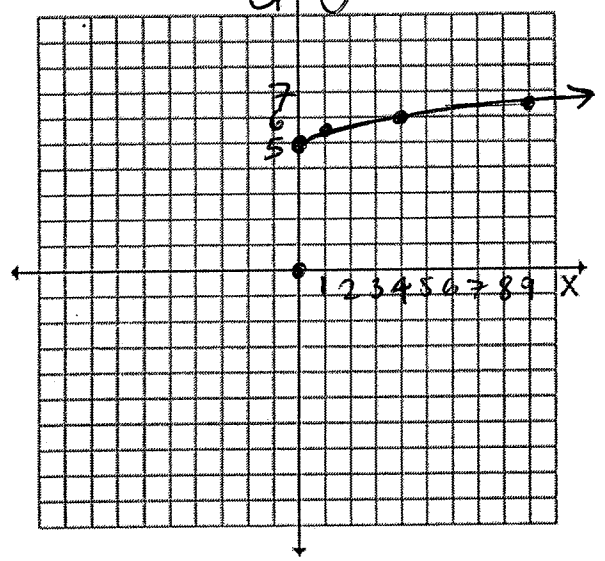
$y = a\sqrt{x-h} + k$   
 Always a "starting value" at  $(h, k)$

PICK X values that will cause perfect squares in the radicand, THEN y values increase/decrease by the "a" value

(2) Graph  $y = \frac{1}{2}\sqrt{x} + 5$

x	0	1	4	9	16
y	5	5.5	6	6.5	7

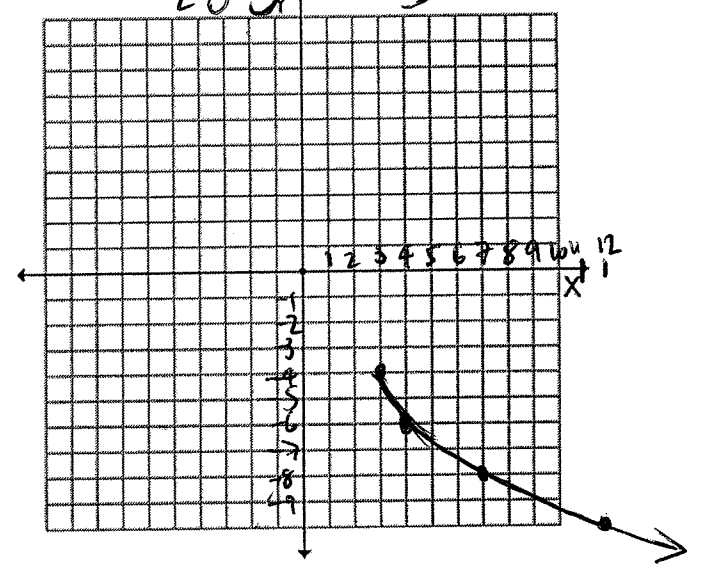
Domain:  $\{x : x \geq 0\}$   
 Range:  $\{y : y \geq 5\}$



(3) Graph  $y = -2\sqrt{x-3} - 4$

x	3	4	7	12	19
y	-4	-6	-8	-10	-12

Domain:  $\{x : x \geq 3\}$   
 Range:  $\{y : y \leq -4\}$



Main topic #2: Simplify radical expressions

(4) Simplify:  $(1 + \sqrt{2})(3 - \sqrt{2})$

$$3 - \sqrt{2} + 3\sqrt{2} - 2$$

$$3 + 2\sqrt{2} - 2$$

$$1 + 2\sqrt{2}$$

(5) Simplify:  $\sqrt{18} - 2\sqrt{27} + 3\sqrt{3} - 6\sqrt{8}$

$$3\sqrt{2} - 6\sqrt{3} + 3\sqrt{3} - 12\sqrt{2}$$

$$-9\sqrt{2} - 3\sqrt{3}$$

Main topic #3: Solve radical equations

(6) Solve:  $3\sqrt{x} - 16 = 20$   
 $+16 +16$

$3\sqrt{x} = 36$   
 $(\sqrt{x})^2 = (12)^2$   
 $x = 144$

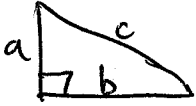
(7) Solve:  $(\sqrt{x-1})^2 = (x-7)^2$

CHECK  
 $\sqrt{10-1} = 10-7$   $\sqrt{5-1} = 5-7$   
 $\sqrt{9} = 3$   $\sqrt{4} = -2$   
 $3 = 3\sqrt{1}$   $2 = -2$   
 NO

$x-1 = x^2 - 14x + 49$   
 $-x+1 -x+1$   
 $0 = x^2 - 15x + 50$   
 $0 = (x-10)(x-5)$   
 $x = 10, 5$  extraneous  
 $x = 10$

Main topic #4 : Pythagorean Theorem

(8) What is the Pythagorean Theorem? When does it work?

$a^2 + b^2 = c^2$   MUST Have a RIGHT TRIANGLE

(9) How long is the hypotenuse if the two legs of a right triangle are 6 inches and 9 inches?

$a^2 + b^2 = c^2$   
 $6^2 + 9^2 = c^2$   
 $36 + 81 = c^2$   
 $c^2 = 117$   
 $c = \sqrt{117}$   
 $c = \sqrt{9 \cdot 13}$   
 $c = 3\sqrt{13}$  inches

(10) Find the missing length in a right triangle with the given values:  $a = ?$   $b = 6$   $c = 12$

$a^2 + b^2 = c^2$   
 $a^2 + 6^2 = 12^2$   
 $a^2 = 108$   
 $a = \sqrt{108}$   
 $a = \sqrt{36 \cdot 3}$   
 $a = 6\sqrt{3}$  units

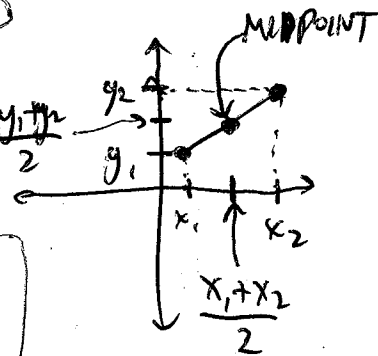
Main topic #5 : Midpoint Formula

(11) What is the midpoint formula? How is it related to averages?

$(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$  TO FIND MIDPOINT OF A SEGMENT, SIMPLY FIND THE AVERAGE OF BOTH THE X AND Y-VALUES.

(12) Find the midpoint between  $(-5, -10)$  and  $(5, 4)$ .

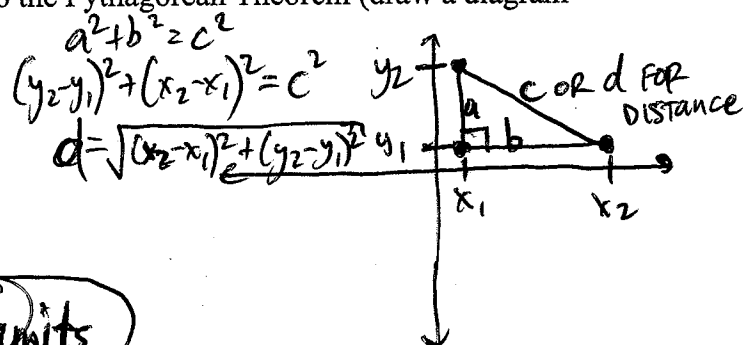
$(\frac{-5+5}{2}, \frac{-10+4}{2}) \rightarrow (\frac{0}{2}, \frac{-6}{2}) \rightarrow (0, -3)$



Main topic #6 : Distance Formula

(13) What is the distance formula? How is it related to the Pythagorean Theorem (draw a diagram to show this)?

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$



(14) Find the distance between  $(3, -4)$  and  $(-6, 8)$ .

$d = \sqrt{(-6-3)^2 + (8-(-4))^2}$   
 $d = \sqrt{81 + 144}$   
 $d = \sqrt{225}$   
 $d = 15$  units