STUDY GUIDE for Algebra 2nd Semester End of Course Exam

This study guide is designed to help prepare you for the end of course exam. It contains a variety of questions similar to the problems you will find on the exam. Below each question is a page number, chapter and section number, or web code which might be helpful for that particular content. Web codes look like bae-xxx and are entered in at PHSCHOOL.COM. They contain links to videos which might also be helpful. When in doubt, ask your teacher.

If you are unable to complete a problem entirely on your own it is highly recommended that you practice several more problems out of the book until you are able to do so.

This study guide contains only a sample of the end of course exam. The actual exam consists of 50 multiple choice questions.

1) How many solutions are there in the solution set of the quadratic equation $x^2 - 3x + 4 = 0$?

    a.   no real solution   c.   two real solutions

    b.   one real solution   d.   more than two real solutions

       Page 470-471; bae-0908

2) $\sqrt{25} + \sqrt[3]{27} =$

Page 486

3) Write the expression below with positive exponents.

$$\frac{10a^4 b^3}{2a^{-2} b^2}$$

Page 329

4) The area of a rectangle is $20x^4 y^2$ square units. One side of the rectangle is $5x^2 y$ units long. How long is the other side of the rectangle?

Page 541, example 3, bae-1103

5) What is the simplest form of the expression $\dfrac{6x^3}{14x^8}$?

Page 352; bae-0775

6) Two sides of a rectangle are given. One side is $x^2 + 2x - 3$ units long. The other side is $2x^2 + x + 2$ units long. What is the perimeter of the rectangle?

Page 372; examples 3 and 4; bae-0801

7) Barry wants his new rectangular garden to have half of the perimeter of his old rectangular garden. The sides of his old garden are $3x + 4y - 2z$ and $8x + 2z - 3y$ units long. What will be the new perimeter of the garden?

Page 372; bae-0801

8) What is the simplest form of $\dfrac{3x^2 - 9x}{x - 3}$?

Page 530; bae-1101

9) Reduce the expression $\dfrac{x^2 - 1}{x^2 + 2x + 1}$ to lowest terms.

Page 531; bae-1101

10) What is $\left(\dfrac{x^2 - 25}{x^2 - 4x} \right)\left(\dfrac{x^2 + x - 20}{x^2 + 10x + 25} \right)$ reduced to lowest terms?

Page 535;536; bae-1102

11) Divide $\dfrac{12 + 3t}{5t} \div \dfrac{t + 4}{10t}$

Page 536; bae-1102

12) $\dfrac{-3x^4}{6} \div \dfrac{3x}{5} =$

Page 41; page 351

13) $\dfrac{3x}{6x^2} + \dfrac{5}{12x^3} =$

Page 546 (example 3); bae-0775

14) What are the solutions for the quadratic equation $3x^2 + 5x = 5x + 27$?

Page 446 (example 2); bae-0904

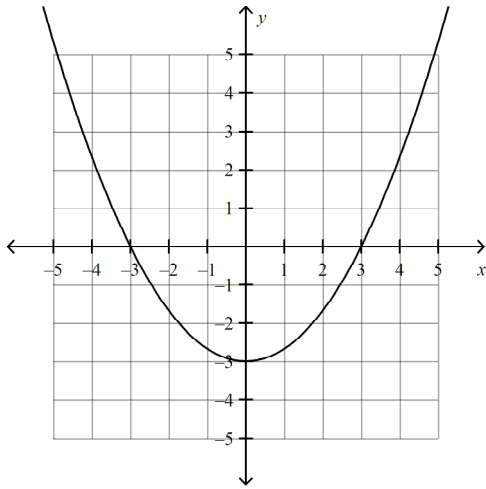15) What are the solutions for the quadractic equation $3r^2 + 16r = -5$?

Page 453; bae-0905

16) What are the solutions of the quadratic equation $5y^2 + 16y - 84 = 0$?
Hint: Use the quadratic formula. In fact, several problems of the exam involve using the quadratic formula, sometimes with numbers that are not whole numbers!

Page 464;bae-0907

17) What are the solutions of the quadratic equation $\frac{1}{2}y^2 + 4y + 6 = 0$?

Page 452; bae-0905

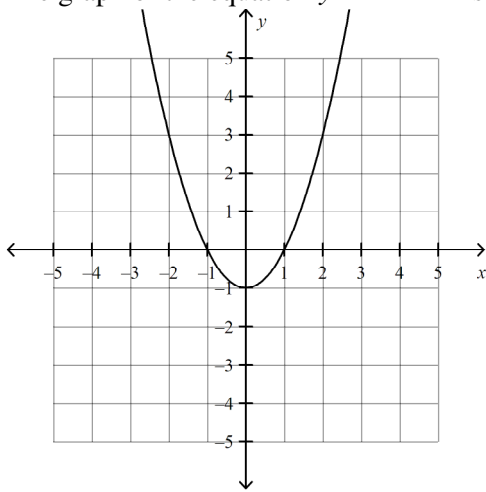18) The graph of the equation $y = \frac{1}{3}x^2 - 3$ is shown below.

For what value or values of x is $y = 0$?

Page 445; bae-0904

19) Sketch a graph of the quadratic equation $y = x^2 + 4x - 4$?

Page 433; bae-0902

20) The graph of the equation $y = x^2 - 1$ is shown below.

For what value or values of x is $y = 0$?

Chapters 9-1 to 9-2

21) Sketch a graph of the quadratic equation $y = \frac{1}{4}x^2 + 2x - 3$.
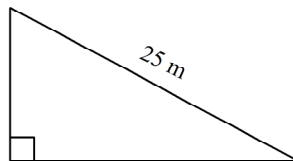
Page 433; bae-0902

22) Sketch a graph of the quadratic equation $y = -\frac{1}{5}x^2 + 5$.

Page 428 (example 2); bae-0901

23) The length of the base of a triangle is 4 inches longer than its height. The area of the triangle is 16 in^2. What is the height of the triangle?

24) The formula $d = 0.5at^2$ gives the distance d of an object starting at rest t seconds after it is released with initial acceleration, a. A ball rolls down the ramp shown below with an acceleration of 3 m/s^2. How long, to the nearest tenth, does it take for the ball to roll down the ramp?

Page 445-6; Page 448 #34; bae-0904

25) A sea cliff off of Baja, Mexico is approximately 40 feet above the water. The equation $h = -16t^2 + 1.6t + 40$ gives a diver's approximate height h after t seconds. To the nearest tenth, about how long does it take the diver to enter the water?

Page 463-5; bae-0907
You'll need a calculator for this one!In fact, make sure you are quite adept at using your calculator along with the quadratic equation.

26) Steve Fossett is flying in a hot air balloon. From an altitude of 2,000 feet, Steve throws a ball straight down toward the ground. When the ball leaves his hand, its speed is 25 feet per second. Approximately how long will it take the ball to hit the ground? This situation can be modeled by the equation $h = -16t^2 + vt + s$, where h is height, v is initial velocity, t is time, and s is initial height.

Page 470; bae-0908
You'll need a calculator for this one too.

27) The width of a rectangle is 4 cm less than the length. The area of the rectangle is 21 cm^2. What are the dimensions of the rectangle?

Page 452, page 4

28) The equation $-16t^2 + 25t$ models the height of a soccer ball t seconds after it is kicked. To the nearest hundredth of a second, when will the height of the ball reach 8 feet?

Page 465; bae-0907

29) A whale jumped out of the water. Its path can be modeled by the equation $h = -0.5d^2 + 2d$, where h represents the height of the whale and d represents horizontal distance in feet. How far did the whale jump?

Page 465; bae-0907

30) A local park has a lake with a water cannon that sprays the water across the lake. The path of the water spray is modeled by the equation $h = -0.009d^2 + 1.4d + 10$, where h is the height of the water spray and d is the distance in feet across the lake. How far across the lake does the water land?

Page 465; bae-0907
You'll want a calculator for this one too!