

SIWS Solving Quadratic Equations Test Outline

Test will be a combination of multiple choice and short answer. It will be worth 100 points and you may use a non-graphing calculator. Below is a brief outline of topics you should review tonight to prepare for the test. Try to keep in mind the saying, "HARD WORK = TALENT!"

1.) Solving quadratic equations using the four different methods : factoring, square root, quadratic formula and completing the square

2.) Using the discriminant to : determine if expression is prime and how many solutions an equation has without solving it

3.) Simplifying radicals



**1.) Solving quadratic equations using the four different methods :
factoring, square root, quadratic formula and completing the square**

Zero-Product Property

If the product $ab = 0$, then $a = 0$ or $b = 0$.

In Exercises 11–16, solve the equation by factoring.

11. $x^2 + 5x - 2 = 4$

13. $2x^2 + 5x + 8 = 5$

15. $3x^2 + 7x + 5 = 3$

12. $3x^2 + 11x - 3 = 1$

14. $6x^2 + 13x + 15 = 10$

16. $12x^2 - 5x - 1 = 2$

Difficult doesn't
mean impossible,
It simply means
that you have to
work hard.

*1.) Solving quadratic equations using the four different methods :
factoring, **square root**, quadratic formula and completing the
square*

25. $\frac{1}{2}x^2 + 3 = 8$

26. $4x^2 + 9 = 41$

27. $6s^2 - 2 = 0$

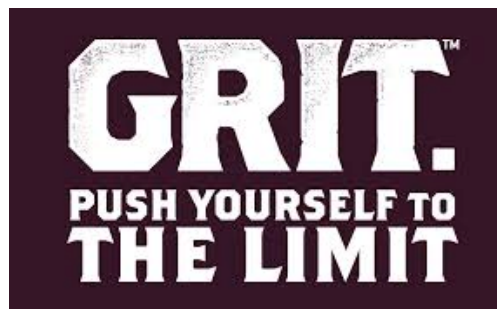
Grit - firmness of mind or spirit;
unyielding courage in the face
of hardship or danger.
~Merriam-Webster Dictionary

1.) Solving quadratic equations using the four different methods :
factoring, square root, **quadratic formula** and completing the square

Solve $2x^2 - 3x = 8$.

Find the x-intercepts of $y = -x^2 - 2x + 5$.

$$25y = -x^2 - 2x + 5$$



**1.) Solving quadratic equations using the four different methods :
factoring, square root, quadratic formula and *completing the square***

In Exercises 11–28, solve the equation by completing the square.

11. $x^2 + 10x - 11 = 0$

14. $y^2 - 8y + 12 = 0$

17. $x^2 - \frac{2}{3}x - 3 = 0$

20. $1 + x - x^2 = 0$

23 $2x^2 - 6x - 15 = 5$

26 $4x^2 + 6x - 6 = 2$

12. $x^2 + 14x - 15 = 0$

15. $t^2 + 3t - \frac{7}{4} = 0$

18. $x^2 + \frac{4}{5}x - 1 = 0$

21 $4y^2 + 4y - 9 = 0$

24 $5x^2 - 20x - 20 = 5$

27. $x^2 + 2x = 2$



**1.) Solving quadratic equations using the four different methods :
factoring, square root, quadratic formula and completing the square**

In Exercises 29–43, use the most convenient method to solve the equation. Explain why you made your choice.

29. $x^2 - 3x - 1 = 0$

30. $4x^2 - 12 = 0$

32. $4x^2 - 25 = 0$

33. $x^2 + 7x + 10 = 0$

35. $3x^2 - 5x = 0$

36. $y^2 + 2y - 26 = 0$

38. $4x^2 + 4x + 1 = 0$

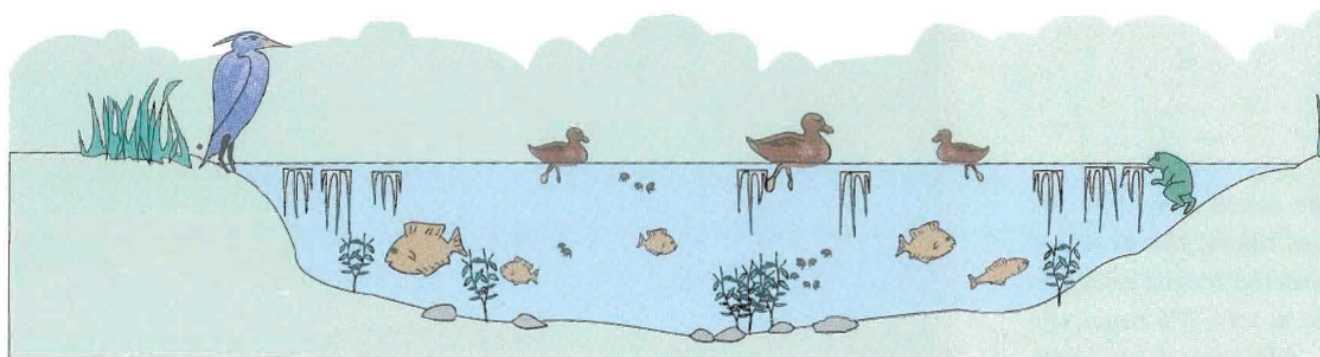
39. $7x^2 - 14x = 0$

41. $8x^2 - 10x + 3 = 0$

42. $7x^2 - 14 = 0$

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34. The bed of a pond can be modeled by $y = x^2 - 6x - 7$, where x and y are measured in meters and the x -axis matches the water level of the pond. What is the width of the pond?



In the quadratic formula, the expression $b^2 - 4ac$ is the **discriminant**.

$$x = \frac{-b \pm \sqrt{\overset{\text{Discriminant}}{b^2 - 4ac}}}{2a} \quad \text{Quadratic formula}$$

The discriminant of a quadratic equation can be used to find the number of solutions of the quadratic equation.

The Number of Solutions of a Quadratic Equation

Consider the quadratic equation $ax^2 + bx + c = 0$.

1. If $b^2 - 4ac$ is positive, then the equation has two solutions.
2. If $b^2 - 4ac$ is zero, then the equation has one solution.
3. If $b^2 - 4ac$ is negative, then the equation has no solution.

2.) Using the discriminant to : determine if expression is prime and how many solutions an equation has without solving it

In Exercises 37–46, use the discriminant to determine whether the polynomial can be factored. If possible, factor the polynomial. (10.4, 10.5)

37. $x^2 - 2x - 15$

39. $x^2 - 64$

41. $x^2 - 8x + 8$

43. $x^2 + 10x + 25$

45. $4x^2 - 32x + 60$

38. $x^2 + 3x - 70$

40. $4x^2 + 25$

42. $9x^2 + 12x + 4$

44. $x^2 - 8x + 16$

46. $3x^2 + 21x + 30$



2.) Using the discriminant to : determine if expression is prime and how many solutions an equation has without solving it

In Exercises 7–12, decide how many solutions the equation has.

7. $2x^2 + 3x - 2 = 0$

8. $x^2 - 2x + 4 = 0$

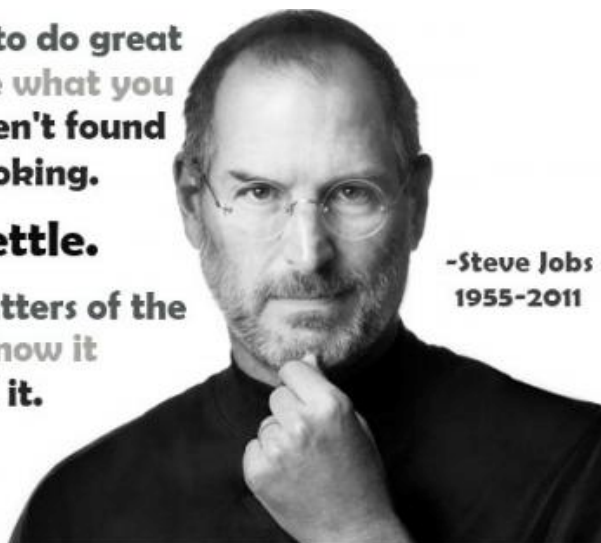
10. $-\frac{1}{2}x^2 + x + 13 = 10$

11. $5x^2 - 2x + 8 = 5$

The only way to do great work is to love what you do. If you haven't found it yet, keep looking.

Don't settle.

As with all matters of the heart, you'll know it when you find it.



-Steve Jobs
1955-2011

3.) Simplifying radicals

In Exercises 7–22, simplify the radical expression.

7. $\sqrt{40}$

8. $\sqrt{18}$

9. $\sqrt{48}$

11. $\sqrt{\frac{7}{9}}$

12. $\sqrt{\frac{11}{16}}$

13. $\sqrt{\frac{2}{50}}$

15. $\frac{1}{2}\sqrt{80}$

16. $\frac{1}{3}\sqrt{27}$

17. $2\sqrt{\frac{5}{4}}$

19. $\sqrt{\frac{1}{12}}$

20. $\sqrt{\frac{4}{5}}$

21. $2\sqrt{\frac{1}{2}}$

In Exercises 23–34, perform the indicated operation. Simplify your result.

23. $\sqrt{5} \cdot \sqrt{15}$

24. $\sqrt{10} \cdot \sqrt{20}$

25. $\sqrt{2} \cdot \sqrt{6} \cdot \sqrt{3}$

26. $\sqrt{2} \cdot \sqrt{3} \cdot \sqrt{5}$

27. $(2\sqrt{13})^2$

28. $(7\sqrt{3})^2$

29. $(\frac{1}{2}\sqrt{8})^2$

30. $(\frac{2}{3}\sqrt{3})^2$

31. $\frac{1}{\sqrt{18}}$

32. $\frac{2\sqrt{5}}{\sqrt{4}}$

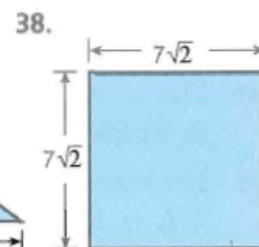
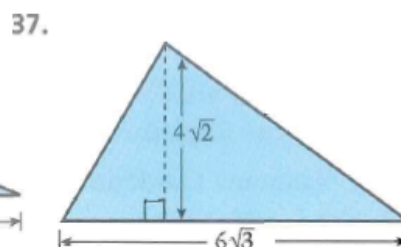
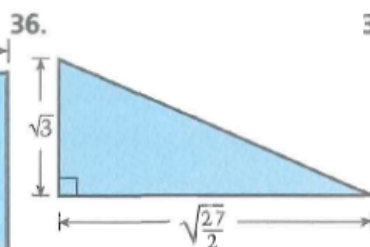
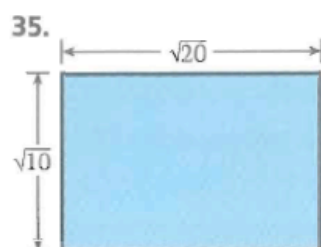
33. $\frac{\sqrt{6}}{\sqrt{2}}$

34. $\frac{6}{\sqrt{3}}$



3.) Simplifying radicals

Geometry In Exercises 35–38, find the area of the figure. Give both the exact answer in simplified form and a decimal approximation rounded to two decimal places.



**Choice, NOT
CIRCUMSTANCES,
DETERMINES YOUR
success.**

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Bonus: Solve for x
using Complete the Square method

$$ax^2 + bx + c = 0$$

$$\frac{\quad \quad \quad -c \quad -c}{ax^2 + bx \quad = -c}$$

$$x^2 + \frac{b}{a}x = -\frac{c}{a}$$