Name: _____ Practice
Block: _____

Algebra 2/Trig H

Collection of problems as practice for the final

Test Format:

1. The test has about 30 questions. Some with multiple parts.
2. You have 120 minutes to complete the test (more if you have accommodations).

Common test instructions:

3. You should SHOW YOUR WORK for all parts of the answer to receive full credit.
4. Write your answers using either blue or black ink or a pencil. Please don't use red pen.
5. There is a clearly indicated space to write down your answer for each question. CLEARLY write your final answer in the space provided. Only ONE answer per question will be considered.

Calculator is NOT allowed on the test.
With accommodation, you are allowed a 4-operations calculator.

Practice questions:

Will be handed out two weeks before the test.

Material covered:

All the material we covered this year. First and second semester included.
The material is available on schoology and on www.drbaharav.org.

==== End

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1. Simplify:
$(2x-3)\cdot(4x^2+6x+9)-(4x^2-3)$

Result:_____

2. Simplify:
$(2x-3)\cdot(2x+3)-(x+4)(2x-8)$

Result:_____

3. Find the equation of the line perpendicular to the line
$$y=5-2x$$
and that includes the point $(1,0)$.
What is the intersection point of these two lines?

Line equation:_____

Intersection point: _____
Plot:

4. Find the equation of the line parallel to the line
$$y-2x=5$$
and that includes the point $(1,1)$.
What is the intersection point of these two lines?

Line equation:_____

Intersection point: _____
Plot:

5. Factor completely:
$$8x^3+27$$

Answer:_____

6. Factor completely:
$$x^2-8x+15$$

Answer:_____

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7. Factor completely:

$$18x^3 - 8x$$

Answer:_____

8. Factor completely:

$$6x^2 - 19x + 15$$

Answer:_____

9. Simplify and give restricted values:

$$\frac{x^2 - 4}{x - 3} \cdot \frac{x^2 - 9}{x^2 + 5x + 6}$$

Restricted Values:_ _____

Simplified:_____

10. Simplify :

$$\frac{(x^3 - y^3)}{2} \div \frac{2x^3y - 2xy^3}{x + y}$$

Restricted Values:_ _____

Simplified:_____

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11. Simplify and give restricted values:

$$\frac{1}{x-4} - \frac{x-1}{x+4} - \frac{6x-16}{x^2-16}$$

Restricted Values:_ _____

Simplified:_____

12. Simplify:

$$\frac{1}{x-4} - \frac{x-1}{x^2-x-12}$$

Restricted Values:_ _____

Simplified:_____

13. Solve:

$$\frac{2}{x^2-9} - \frac{2}{x+3} = \frac{x-4}{x-3}$$

Solution: x= _____

14. Solve:

$$\frac{2}{x^2-3x-4} = \frac{1}{x^2-5x+4}$$

Solution: x= _____

15. Solve:

$$\frac{7}{5x-1} = \frac{1}{(x+1)}$$

Solution: x= _____

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16. Divide using synthetic division:

$$(x^5 + 5x^4 - x^3 - 3x^2 + 5x - 25) \div (x + 5)$$

Answer: _____

17. Divide

$$\frac{30x^8 - 15x^6 + 40x^4}{5x^4}$$

Answer: _____

18. Divide:

$$\frac{\left(\frac{1}{x-4} - \frac{1}{x+4}\right)}{\left(\frac{1}{x-4} + \frac{1}{x+4}\right)}$$

Answer: _____

19. Divide using synthetic division:

$$(x^5 - 32) \div (x - 2)$$

Answer: _____

20. Divide (long division) :

$$(64y^3 - 8) \div (4y - 2)$$

Answer: _____

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21. Solve

$27^{\frac{2}{3}} =$ _____

$27^{\frac{-2}{3}} =$ _____

22. Solve

$16^{1.5} =$ _____

$\left(\frac{1}{8}\right)^{\frac{-2}{3}} =$ _____

23. Simplify such that there are no fractional or negative exponents:

$$\frac{x^{\frac{3}{4}} \cdot y^{\frac{-3}{5}}}{x^{-0.25} \cdot y^{0.2}}$$

Answer: _____

24. Simplify such that there are no fractional or negative exponents:

$$\left(x^{\frac{3}{4}} \cdot y^{\frac{2}{3}}\right)^6 \div \left(x^{\frac{-2}{8}} \cdot y^2\right)$$

Answer: _____

25. Simplify:

$$\sqrt[4]{\frac{64x^5y^7}{36xy^2}}$$

Answer: _____

26. Complete the three missing boxes

$$\sqrt[3]{\frac{81x^8y^{-3}}{z^2}} = \frac{3 \cdot \square}{\square \cdot z} \cdot \sqrt[3]{\square x^2 z}$$

Answer: _____

27. Simplify:

$$2\sqrt{32} - \sqrt{50} + \sqrt{162}$$

Answer: _____

28. Simplify :

$$\sqrt[3]{24} - \sqrt[3]{81}$$

Answer: _____

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29. Simplify (rationalize denominator)

$$\frac{\sqrt{3}+5}{7+\sqrt{3}}$$

Answer: _____

30. Simplify (rationalize denominator)

$$\frac{4-2i}{4+2i}$$

Answer: _____

31. Simplify

$$\left(\sqrt{-9}+\sqrt{9}\right)\cdot\left(\sqrt{4}+\sqrt{-4}\right)$$

Answer: _____

32. Simplify

$$2i\cdot\left(\sqrt{-9}+\sqrt{9}\right)+i\cdot\left(\sqrt{4}+\sqrt{-4}\right)$$

Answer: _____

33. Solve and check

$$x-5=\sqrt{x+7}$$

Answer: _____

34. Solve and check

$$\sqrt{x+7}+8=x+3$$

Answer: _____

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35. Solve: $x^2 - 81 = 0$ **Answer:** _____	36. Solve : $x^2 - 81x = 0$ **Answer:** _____
37. Solve: $-x^2 + 4x - 3 = 0$ **Answer:** _____	38. Solve: $\frac{1}{2}y^2 - 3y + 9 = 0$ **Answer:** _____
39. Solve using "Complete the square": $x^2 + 8x - 9 = 0$ **Answer:** _____	40. Solve using "Complete the square": $4x^2 + 12x - 7 = 0$ **Answer:** _____

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41. Solve

$$x^2 - 4x + 1 = 0$$

Answer: _____

42. Solve

$$x^2 + 81 = 0$$

Answer: _____

43. Find three consecutive integers such that the square of the first plus the product of the other two is 46. (you can use four operation calculator for this question)

Answer: _____

44. Find three consecutive even integers such that the square of the middle one plus the product of the other two is 28. (you can use four operation calculator for this question)

Answer: _____

45. Find three consecutive odd integers such that twice the first plus the product of the other two is 73. (you can use four operation calculator for this question)

Answer: _____

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Graph the following functions. Indicate (if relevant) x-intercepts, y-intercepts, vertex, and any other significant points, and then plot the functions.

46.

$$f(x) = 2 \cdot (1 - x) \cdot (x - 3)$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

47.

$$f(x) = 4x - x^2$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

48.

$$f(x) = x^2 - 4x + 5$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

49.

$$f(x) = -(x - 1)^2 + 2$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

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50.

$$f(x) = x^2 - 4x + 4$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

51.

$$f(x) = 7 - x$$

X_intercept:_____
Y_intercept:_____
Vertex:_____

Plot:

52. The sum of two even numbers is 16. Find the numbers such that their product is maximum.

Answer: _____

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53. Graph the following function

$$f(x) = 2x^4 - 15x^3 + 39x^2 - 41x + 15$$

Hint: The function has roots at 1 and 3.

Factored polynomial:_____

Roots: _____

End Behavior:_____

Graph:

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54. Solve for x:

a. $x = \log_2 64$ **x=**_____

b. $2 = \log_7 x$ **x=**_____

c. $2^{x+2} = 32$ **x=**_____

55. Solve for x:

a. $x^2 = \log_2 16$ **x=**_____

b. $2 = \log_7 x^2$ **x=**_____

c. $2^{(x^2)} = 64$ **x=**_____

56. Calculate the following.

a. $\log 4 + \log 250 =$ _____

b. $\log_2 3 - \log_2 48 =$_____

c. $\log(10000) - \frac{\log_4 27}{\log_4 3} =$_____

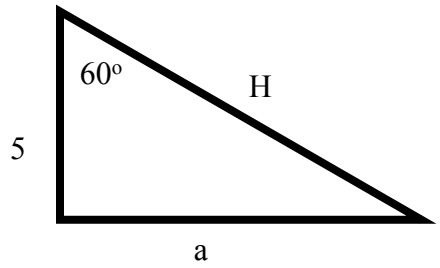
d. $\log_4\left(\frac{1}{2}\right) =$ _____

e. $\log_2\left(8^{\frac{3}{2}}\right) =$ _____

57. Give the value of the following functions.

a. $\cos(30°) =$_____
b. $\sin(30°) =$_____
c. $\tan(30°) =$_____

58. Calculate 'a' and 'H' in the below.
a = _____ **H=**_____



59. Determine if each of the below is geometric, arithmetic, or neither

a. 1,4,9,16,25,36, …

b. $\frac{1}{2}, \frac{3}{5}, \frac{5}{8}, \frac{8}{11} \ldots$

c. $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2} \ldots$

60. Calculate the sum:

$$\sum_{n=0}^{101} (n - 50) = ?$$

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61. Given the functions

$f(x) = 2x^2 - 1$ and
$g(x) = x^2 - 3$

a. Find $f(g(x))$

b. Find $g(f(x))$

c. Find $g(x) + f(x)$

62. Given the functions

$f(x) = |2x - 1|$ and
$g(x) = x^2 - 3$

a. Find $f(g(x))$

b. Find $g(f(x))$

c. Find $g(x) + f(x)$

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63. Find the inverse of f(x) using Table and algebraic method, and plot both:

$$f(x) = 1 - \sqrt{x - 2}$$

Remember to indicate range and domain of each function.

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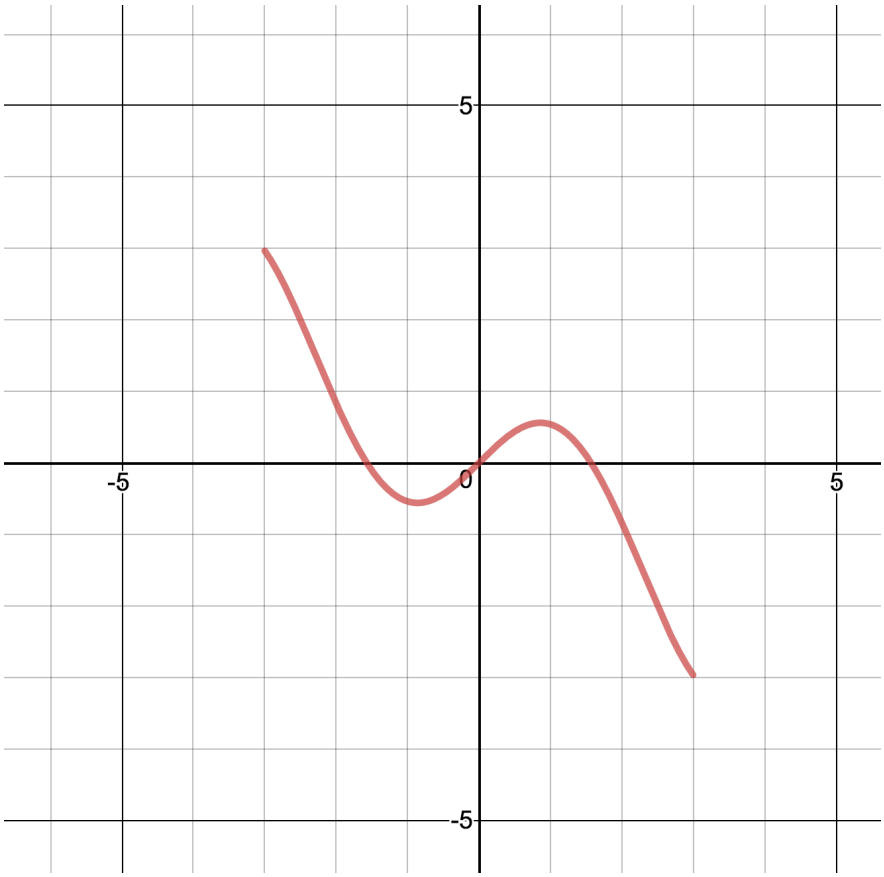
64. Given the function $f(x)$:



Find Range and Domain: _____

Is the function Even/Odd? _____

Graph $f(x+2)$. Range and Domain: _____

Graph $f\left(\frac{x}{2}\right)$. Range and Domain: _____