Name: _____ Practice
Block: _____

Algebra 2/Trig H

Collection of problems as practice for the final

Zachi
solution key.

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:

$(2x-3)\cdot(4x^2+6x+9)-(4x^2-3)$

$(2x)^3-(3)^3-4x^2+3=$

$=8x^3-27-4x^2+3$

$=8x^3-4x^2-24$

Result: $8x^3-4x^2-24$

2. Simplify:

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

$4x^2-9-(x+4)(x-4)\cdot 2=$

$=4x^2-9-2(x^2-16)=$

$=4x^2-9-2x^2+32=2x^2+23$

Result: $2x^2+23$

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?

$m=-2 \rightarrow m_\perp=\frac{1}{2} \Rightarrow y=\frac{1}{2}x-\frac{1}{2}$

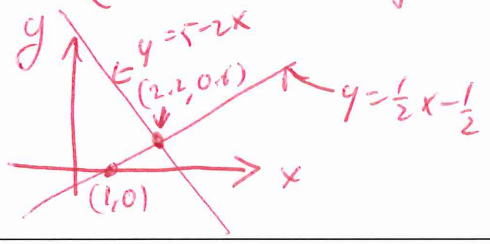
Line equation: $y=\frac{1}{2}x-\frac{1}{2}$

$\frac{1}{2}x-\frac{1}{2}=5-2x \Rightarrow 2\frac{1}{2}x=5\frac{1}{2} \Rightarrow \frac{5}{2}x=\frac{11}{2}$

$x=\frac{11}{5}$

Intersection point: $(2.2, 0.6)$ $y=0.6$

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?

$y=2x+5 \quad m=2 \Rightarrow m_{\parallel}=2$

$y=2x-1$

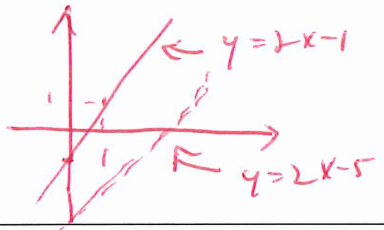
Line equation: $y=2x-1$

$2x+5=2x-1$

$5=-1$

Intersection point: Never meet!

Plot:



5. Factor completely:

$$8x^3+27$$

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

Answer: $(2x+3)(4x^2-6x+9)$

6. Factor completely:

$$x^2-8x+15$$

M	A	T
15	-8	-3, -5

$x^2-5x-3x+15=$

$x(x-5)-3(x-5)=(x-3)(x-5)$

Answer: $(x-3)(x-5)$

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7. Factor completely:

$$18x^3 - 8x$$

$2x(9x^2-4) =$

$2x[(3x)^2-(2)^2] =$

$= 2x(3x-2)(3x+2)$

Answer: $2x(3x-2)(3x+2)$

8. Factor completely:

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

M	A	T
90	-19	-10, -9

$6x^2 - 9x - 10x + 15 =$

$3x(2x-3) - 5(2x-3) =$

$(2x-3)(3x-5)$

Answer: $(2x-3)(3x-5)$

9. Simplify and give restricted values:

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

M	A	T
6	5	3, 2

$\rightarrow (x+3)(x+2)$

$\frac{(x+2)(x-2)}{(x-3)} \cdot \frac{(x+3)(x-3)}{(x+3)(x+2)} =$

$= \boxed{x-2}$

Restricted Values: $x \neq 3, -3, -2$

Simplified: $x-2$

10. Simplify :

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

$\frac{(x-y)(x^2+xy+y^2)}{2} \cdot \frac{(x+y)}{2xy(x^2-y^2)} =$

$= \frac{(x-y)(x^2+xy+y^2)}{4xy} \frac{(x+y)}{(x+y)(x-y)}$

Restricted Values: $x \neq y, -y, \; x \neq 0, \; y \neq 0$

Simplified: $\frac{x^2+xy+y^2}{4xy}$

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11. Simplify and give restricted values:

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

$\frac{1}{x-4} - \frac{x-1}{x+4} - \frac{6x-16}{(x-4)(x+4)} =$

$= \frac{(x+4) - (x-1)(x-4) - (6x-16)}{(x-4)(x+4)} =$

$= \frac{x+4 - x^2+5x-4 - 6x+16}{(x-4)(x+4)} = \frac{-x^2+16}{(x-4)(x+4)}$

$= \frac{(4-x)(4+x)}{(x-4)(x+4)}$

$= \frac{4-x}{x-4} = -1$

Restricted Values: $x = 4, -4$

Simplified: -1

12. Simplify:

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

$\frac{1}{x-4} - \frac{x-1}{(x-4)(x+3)} =$

$= \frac{x+3 - x+1}{(x-4)(x+3)} = \frac{4}{(x-4)(x+3)}$

Restricted Values: $x \neq 4, -3$

Simplified: $\frac{4}{(x-4)(x+3)}$

13. Solve:

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

$x \neq +3, -3$

$\frac{2}{(x+3)(x-3)} - \frac{2}{x+3} = \frac{x-4}{x-3} = 0$

$\frac{2 - 2x+6 - x^2+x+12}{(x+3)(x-3)} = 0$

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

$(-1)(x-4)(x+5) = 0$

$x = 4$ or $x = -5$

Solution: x= $x = 4$ or $x = -5$

14. Solve:

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

$(x-4)(x+1)$ $(x-4)(x-1)$

$x = 4, 1, -1$

$\frac{2(x-1)}{(x-4)(x+1)(x-1)} = \frac{1 \cdot (x+1)}{(x-4)(x-1)(x+1)}$

$2x-2 = x+1$

$x = 3$

check: $\frac{2}{-4} \stackrel{?}{=} \frac{1}{-2}$

$-\frac{1}{2} \stackrel{?}{=} -\frac{1}{2}$ ✓

Solution: x= $x = 3$

15. Solve:

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

$x \neq -1, \frac{1}{5}$

$7(x+1) = 5x-1$

$7x+7 = 5x-1$

$2x = -8$

$x = -4$

check: $\frac{7}{-21} \stackrel{?}{=} \frac{1}{-3}$

$-\frac{1}{3} \stackrel{?}{=} -\frac{1}{3}$ ✓

Solution: x= $x = -4$

check: $x=4$ $\frac{2}{7} - \frac{2}{7} \stackrel{?}{=} \frac{4-4}{1}$

$0 = 0$ ✓

$x=-5$ $\frac{2}{16} - \frac{2}{-2} \stackrel{?}{=} \frac{-9}{-8}$ $1\frac{1}{8} \stackrel{?}{=} 1\frac{1}{8}$ ✓

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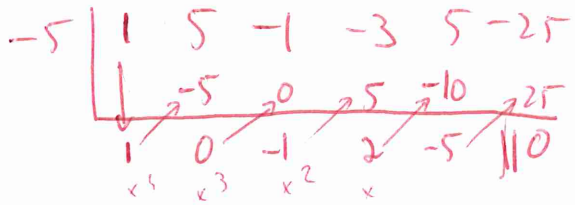
16. Divide using synthetic division:

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



Answer: $x^4 - x^2 + 2x - 5$

17. Divide

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

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

Answer: $6x^4 - 3x^2 + 8$

18. Divide:

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

$\frac{1}{x-4} - \frac{1}{x+4} = \frac{x+4-(x-4)}{(x-4)(x+4)} = \frac{8}{(x-4)(x+4)}$ (x)

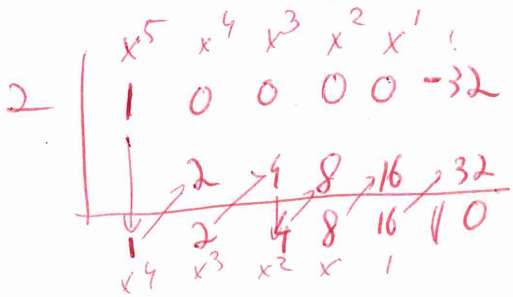
$\frac{1}{x-4} + \frac{1}{x+4} = \frac{x+4+(x-4)}{(x-4)(x+4)} = \frac{2x}{(x-4)(x+4)}$ (xx)

$\frac{x}{xx} = \frac{8}{2x} = \frac{4}{x}$

Answer: $\frac{4}{x}$

19. Divide using synthetic division:

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



Answer: $x^4 + 2x^3 + 4x^2 + 8x + 16$

20. Divide (long division) :

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

$16y^2 + 8y + 4$

$4y - 2 \overline{)\, 64y^3 + 0y^2 + 0y - 8}$

$64y^3 - 32y^2$

$32y^2 + 0y$

$32y^2 - 16y$

$16y - 8$

$16y - 8$

Answer: $16y^2 + 8y + 4$

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21. Solve

$27^{\frac{2}{3}} =$ 9 $\quad (\sqrt[3]{27})^2 = 3^2 = 9$

$27^{-\frac{2}{3}} =$ $\frac{1}{9}$ $\quad \frac{1}{(27)^{\frac{2}{3}}}$

22. Solve

$16^{1.5} =$ 64 $\quad 16^{\frac{3}{2}} = (\sqrt{16})^3 = 4^3 = 64$

$\left(\frac{1}{8}\right)^{-\frac{2}{3}} =$ 4 $\quad 8^{\frac{2}{3}} = 2^2 = 4$

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

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

$\frac{x^{\frac{3}{4}} \cdot y^{-\frac{3}{5}}}{x^{-\frac{1}{4}} \cdot y^{\frac{1}{5}}} = \frac{x}{y^{\frac{4}{5}}}$

Answer: $\frac{x}{y^{\frac{4}{5}}} = \frac{x}{\sqrt[5]{y^4}}$

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

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

$\frac{x^{\frac{3\cdot 6}{4}} \cdot y^{\frac{2\cdot 6}{3}}}{x^{-\frac{1}{4}} \cdot y^2} = \frac{x^{\frac{9}{2}} y^4}{x^{-\frac{1}{4}} y^2} = x^{\frac{19}{4}} \cdot y^2$

Answer: $\sqrt[4]{x^{19} \cdot y^2}$

25. Simplify:

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

$\frac{64}{36} = \frac{16}{9}$ $\quad \sqrt[4]{\frac{16}{9}} = 2\sqrt[4]{\frac{1}{9}}$

$\frac{x^5}{x} = x^4 \Rightarrow |x|$ $\quad \frac{y^7}{y^2} = y^5 \Rightarrow y\sqrt[4]{y}$

Answer: $2 \cdot |x| \cdot y \cdot \sqrt[4]{\frac{y}{9}}$

26. Complete the three missing boxes

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

$\sqrt[3]{81} = \sqrt[3]{27 \cdot 3} = 3\sqrt[3]{3}$ $\quad \sqrt[3]{y^{-3}} = \sqrt[3]{\frac{1}{y^3}} = \frac{1}{y}$

$\sqrt[3]{x^8} = \sqrt[3]{x^6 \cdot x^2} = x^2\sqrt[3]{x^2}$

$\frac{1}{z^2} = \frac{z}{z^3} \Rightarrow \sqrt[3]{\quad} = \frac{1}{z}\sqrt[3]{z}$

$\frac{3x^2}{y \cdot z}\sqrt[3]{3x^2z}$

Answer:

27. Simplify:

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

$16 \cdot 2$ $\quad 25 \cdot 2$ $\quad 81 \cdot 2$

$8\sqrt{2} - 5\sqrt{2} + 9\sqrt{2} = 12\sqrt{2}$

Answer: $12\sqrt{2}$

28. Simplify :

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

$8 \cdot 3$ $\quad 27 \cdot 3$

$2\sqrt[3]{3} - 3\sqrt[3]{3}$

Answer: $-\sqrt[3]{3}$

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29. Simplify (rationalize denominator)

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

$\frac{(\sqrt{3}+5)(7-\sqrt{3})}{(7+\sqrt{3})(7-\sqrt{3})} = \frac{2\sqrt{3}-3+35}{49-3} = \frac{2\sqrt{3}+32}{46}$

Answer: $\frac{\sqrt{3}+16}{23}$

30. Simplify (rationalize denominator)

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

$\frac{(4-2i)(4-2i)}{(4+2i)(4-2i)} = \frac{16-16i+4i^2}{16+4} = \frac{12-16i}{20} = \frac{3-4i}{5}$

Answer: $\frac{3-4i}{5}$

31. Simplify

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

$(3i+3)(2+2i)$

$= 12i+6-6 = 12i$

Answer: $12i$

32. Simplify

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

$2i(3i+3)+i(2+2i)$

$-6+6i+2i-2$

Answer: $-8+8i$

33. Solve and check

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

$(x-5)^2 = x+7$

$x^2-10x+25 = x+7$

$x^2-11x+18=0$

$(x-9)(x-2)=0$

$x=9$ check

$9-5 \stackrel{?}{=} \sqrt{9+7}$

$9 \stackrel{?}{=} 9$ ✓

$x=2$

$2-5 \stackrel{?}{=} \sqrt{2+7}$

$-3 \stackrel{?}{=} 3$ ✗

Answer: $x=9$

34. Solve and check

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

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

$x+7 = x^2-10x+25$

See ← $(x-9)(x-2)=0$

$x=9$ check

$\sqrt{9+7}+8 \stackrel{?}{=} 9+3$

$4+8 \stackrel{?}{=} 12$

✓

$x=2$

$\sqrt{2+7}+8 \stackrel{?}{=} 2+3$

$3+8 \stackrel{?}{=} 5$

✗

Answer: $x=9$

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35. Solve:

$$x^2 - 81 = 0$$

$x^2 = 81$

$x = \pm 9$

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

Answer: $x = 9, -9$

36. Solve :

$$x^2 - 81x = 0$$

$x(x-81)=0$

Answer: $x=0$ or $x=81$

37. Solve:

$$-x^2 + 4x - 3 = 0$$

$x^2 - 4x + 3 = 0$

$(x-3)(x-1)=0$

Answer: $x=3$ or $x=1$

38. Solve:

$$\frac{1}{2}y^2 - 3y + 9 = 0$$

$y^2 - 6y + 18 = 0$

$\frac{6 \pm \sqrt{36-72}}{2} = \frac{6 \pm \sqrt{-36}}{2} =$

$= \frac{6 \pm 6i}{2} = 3 \pm 3i$

Answer: $3 \pm 3i$

39. Solve using "Complete the square":

$$x^2 + 8x - 9 = 0$$

$x^2 + 8x + 16 - 16 - 9 = 0$

$2 \cdot 4$

$(x+4)^2 = 25$

$x+4 = \pm 5$ → $x = 9$ or $x = -1$

Answer: $x=9$ or $x=-1$

40. Solve using "Complete the square":

$$4x^2 + 12x - 7 = 0$$

$2x$ $2 \cdot 2 \cdot 3$ $+9 -9$

$(2x+3)^2 - 9 - 7 = 0$

$(2x+3)^2 = 16$

$2x+3 = \pm 4$ → $x = \frac{1}{2}$ or $x = -3.5$

Answer: $x = \frac{1}{2}$ or $x = -3.5$

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41. Solve

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

$\frac{4 \pm \sqrt{16-4}}{2} = \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2}$

$= 2 \pm \sqrt{3}$

Answer: $x = 2 \pm \sqrt{3}$

42. Solve

$$x^2 + 81 = 0$$

$x^2 = -81$

$x = 9i$

Answer: $x = 9i$

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)

$n^2 + (n+1)(n+2) = 46$

$n^2 + n^2 + 3n + 2 = 46$ → $2n^2 + 3n - 44 = 0$.

$n_1 = 4$, $n_2 = \frac{-5.5}{\text{not integer}}$.

Answer: 4, 5, 6.

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)

$(2n)^2 + (2n-2)(2n+2) = 28$ $(2n-2), 2n, (2n+2)$

$4n^2 + 4n^2 - 4 = 28$

$8n^2 = 32$ → $n^2 = 4$

$n = +2$ or -2 → 2, 4, 6

$16 + 2 \cdot 6 = 28$ ✓

$-2, -4, -6$ ✓

Answer: 2, 4, 6 or −2, −4, −6.

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)

3: 5, 7, 9 → $10 + 63 = 73$ ✓ $2n-1$, $2n+1$, $2n+3$,

−6: −13, −11, −9 → $-26 + 99 = 73$ ✓

$2 \cdot (2n-1) + (2n+1)(2n+3) = 73$

$4n - 2 + 4n^2 + 8n + 3 = 73$

$4n^2 + 12n - 72 = 0$

$n^2 + 3n - 18 = 0$

$n_{1,2} = \frac{-3 \pm \sqrt{9+72}}{2} = \frac{-3 \pm 9}{2} = 3, -6$

Answer: 5, 7, 9 or −13, −11, −9

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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.

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

y-intercept: $x = 0$ $2 \cdot 1 \cdot (-3) = -6$

$0 = 2(1-x)(x-3)$

$2 \cdot [x - 3 - x^2 + 3x] = 2[-x^2 + 4x - 3]$

$= -2x^2 + 8x - 6$

X_intercept: $x = 1, x = 3$

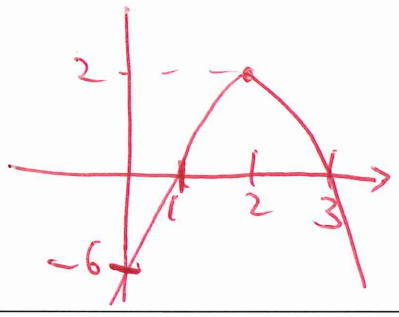
Y_intercept: -6

Vertex: $(2, 2)$ $h = \frac{-b}{2a} = \frac{-8}{-4} = 2$

$2(1-2)(2-3) =$

$-1 \quad -1$

Plot:



47.

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

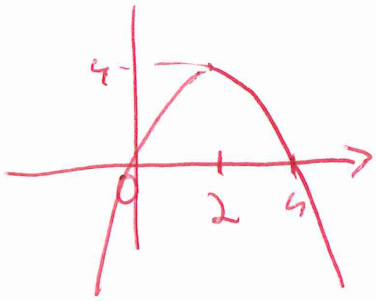
$= x(4 - x)$

X_intercept: $x = 0, x = 4$ $y = 0$

Y_intercept: 0 $x = 0 \Rightarrow y = 0$

Vertex: $(2, 4)$ $h = \frac{-b}{2a} = \frac{-4}{-2} = 2$

Plot:



48.

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

$4 \pm \sqrt{16 - 20}$ negative! $\Rightarrow$ no roots

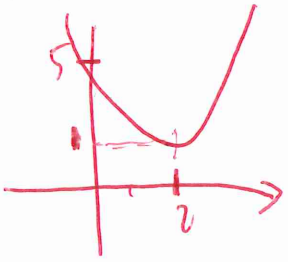
$h = \frac{-b}{2a} = \frac{4}{2} = 2$

X_intercept: Not $y = 0$

Y_intercept: 5 $\Leftarrow x = 0$

Vertex: $(2, 1)$

Plot:



49.

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

$x = 0 \rightarrow y = 1$

$0 = -(x-1)^2 + 2 \Rightarrow (x-1)^2 = 2 \Rightarrow x = 1 \pm \sqrt{2}$

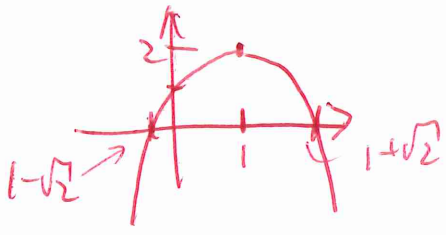
1.14

X_intercept: $x = 1 + \sqrt{2}, x = 1 - \sqrt{2}$

Y_intercept: 1

Vertex: $(1, 2)$

Plot:



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50.

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

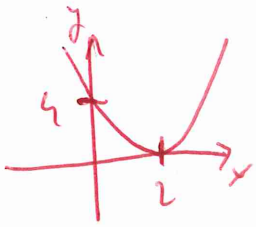
$0 = (x-2)^2$

X_intercept: $x=2$

Y_intercept: 4

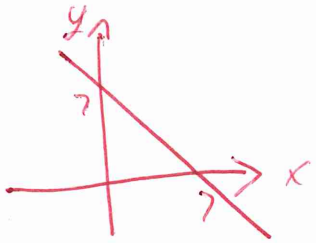
Vertex: $(2,0)$

Plot:



51.

$f(x) = 7 - x$



X_intercept: $x=7$

Y_intercept: 7

Vertex: x

Plot:

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

$2n + 2m = 16$

$n + m = 8$

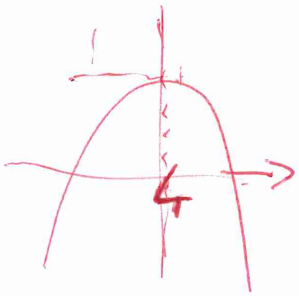
$n = 4 \Rightarrow 2n = 8$

$m = 4 \Rightarrow 2m = 8$

$2n \cdot 2m \to \max$

$4\,n \cdot m = 4n(8-n) = 4(-n^2 + 8n)$

$h = -\frac{b}{2a} = \frac{-8}{-2} = 4$



Answer: 8, 8

Note: 7; 9 is larger, but NOT even.
6; 10 is smaller...

Name: _____ Practice

Block: _____

53. Graph the following function

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

Hint: The function has roots at 1 and 3.

$(x-1)(x-3)$

1 | 2 −15 39 −41 15

2 −13 26 −15

2 −13 26 −15 | 0 $\Rightarrow (2x^3 - 13x^2 + 26x - 15)(x-1)$

3 | 2 −13 26 −15

6 −21 15

2 −7 5 | 0 $(2x^2 - 7x + 5)(x-1)(x-3)$

$x_{1,2} = \frac{7 \pm \sqrt{49-40}}{4} = \frac{7 \pm 3}{4} \rightarrow 2.5, 1$

$(2x-5)(x-1)(x-1)(x-3)$

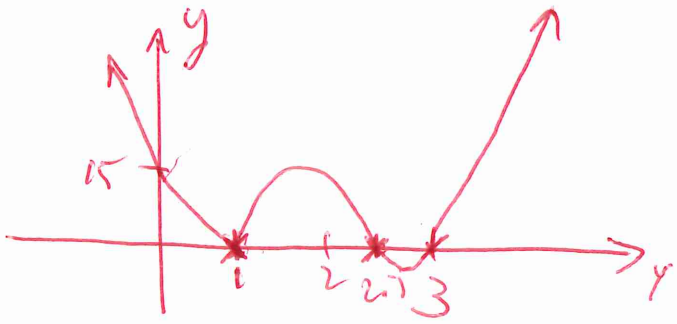
Factored polynomial: _____

Roots: $x = 2.5, 1, 1, 3$

End Behavior: ↑ ↑

y-intercept: 15

Graph:



Name: _____ Practice

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54. Solve for x:

a. $x = \log_2 64$ x= 6

b. $2 = \log_7 x$ x= 49

c. $2^{x+2} = 32$ x= 3

55. Solve for x:

a. $x^2 = \log_2 16$ x= ± 2 or -2

b. $2 = \log_7 x^2$ x= 7

c. $2^{(x^2)} = 64$ x= $\pm\sqrt{6}$

56. Calculate the following.

a. $\log 4 + \log 250 =$ $\log(1000) = 3$

b. $\log_2 3 - \log_2 48 =$ $\log_2\left(\frac{1}{16}\right) = -4$

c. $\log(10000) - \frac{\log_4 27}{\log_4 3} =$ 1

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

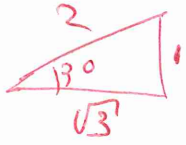
e. $\log_2\left(8^{\frac{3}{2}}\right) =$ $\log_2\left(2^{\frac{9}{2}}\right) = 4.5$

57. Give the value of the following functions.

a. $\cos(30°) =$ $\frac{\sqrt{3}}{2}$

b. $\sin(30°) =$ $\frac{1}{2}$

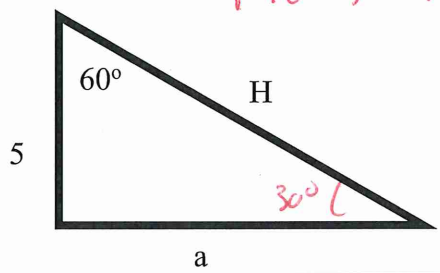
c. $\tan(30°) =$ $\frac{1}{\sqrt{3}}$



58. Calculate 'a' and 'H' in the below.

a = $5\sqrt{3}$ H= $2 \cdot 5 = 10$

$10^2 - 5^2 = \sqrt{75} = \sqrt{3} \cdot 5$



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

a. 1,4,9,16,25,36, ... 3 5 7 neither

b. $\frac{1}{2}, \frac{3}{5}, \frac{5}{8}, \frac{8}{11} \ldots$ $\frac{3}{5} \div \frac{1}{2} = \frac{6}{5}$ $\frac{5}{8} \div \frac{3}{5} = \frac{25}{24}$ neither

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

60. Calculate the sum:

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

$(-50) + (-49) + (-48) + \ldots + (51) =$

$= \frac{(-50 + 51)}{2} \cdot 102 = 51$

arithmetic

Name: _____ Practice

Block: _____

61. Given the functions

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

a. Find $f(g(x))$ $2(x^2-3)^2 - 1 =$

$= 2[x^4 - 6x^2 + 9] - 1 = \boxed{2x^4 - 12x^2 + 17}$

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

$(2x^2-1)^2 - 3 = [4x^4 - 4x^2 + 1] - 3 = \boxed{4x^4 - 4x^2 - 2}$

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

$(2x^2-1) + (x^2-3) = \boxed{3x^2 - 4}$

62. Given the functions

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

a. Find $f(g(x))$ $|2(x^2-3) - 1| = \boxed{|2x^2 - 7|}$

b. Find $g(f(x))$ $(|2x-1|)^2 - 3 = 4x^2 - 4x + 1 - 3$

$= \boxed{4x^2 - 4x - 2}$

c. Find $g(x) + f(x)$ $\boxed{|2x-1| + x^2 - 3}$

Name: _____ Practice

Block: _____

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

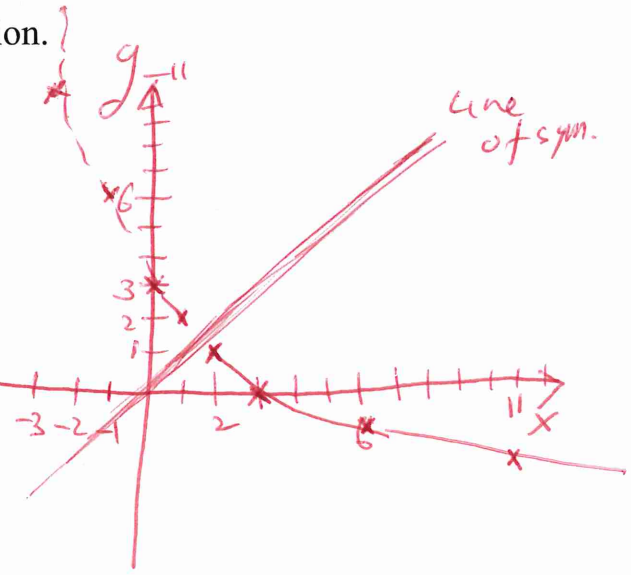
$$f(x) = 1 - \sqrt{x-2}$$

Remember to indicate range and domain of each function.

x	f(x)
2	1
3	0
6	-1
11	-2
18	-3

Domain: $[2, \infty)$

Range: $(-\infty, 1]$



Algebraic

$y = 1 - \sqrt{x-2}$

$x = 1 - \sqrt{y-2}$

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

$y-2$

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

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

Inverse

1	2
0	3
-1	6
-2	11
-3	18

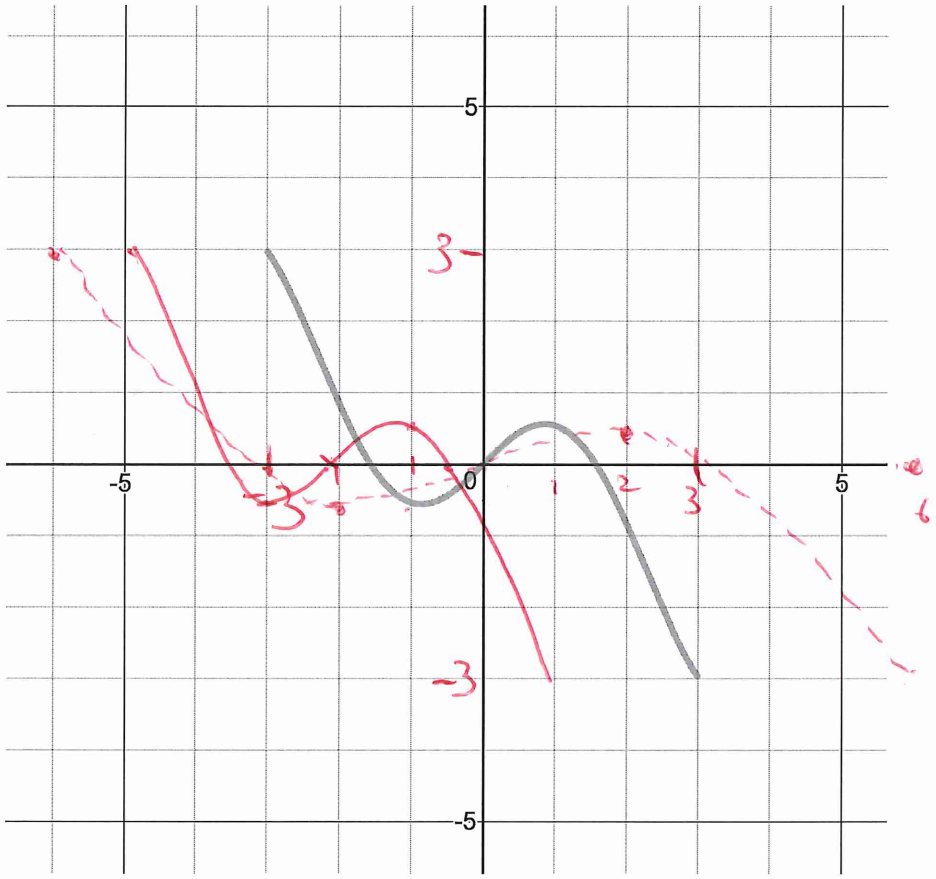
Domain: $(-\infty, 1]$

Range: $[2, \infty)$

Name: _____ Practice

Block: _____

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



Find Range and Domain: Domain: [-3, 3] Range: [-3, 3]

Is the function Even/Odd? Odd

Graph $f(x+2)$. Range and Domain: — : Domain [-5, 1] Range [-3, 3]

Graph $f\left(\frac{x}{2}\right)$. Range and Domain: - - - - Domain [-6, 6] Range [-3, 3]