Tr.t 3MA RFF Sem 1 WS #5 Name KEY Key Per ____ Group ____

1. Find the inverse of $f(x)=\frac{7-2x}{5}+3$

$x=\frac{7-2y}{5}+3$

$5(x-3)=7-2y$

$-2y=5(x-3)-7$

$y=\frac{5(x-3)-7}{-2}$

2. Find the inverse of $f(x)=\log_7(x-11)-6$

$x=\log_7(y-11)-6$

$x+6=\log_7(y-11)$

$7^{x+6}=y-11$

$y=7^{x+6}+11$

3. Find the inverse of $f(x)=\sqrt{4-8x^3}+1$

$x=\sqrt{4-8y^3}+1$

$(x-1)^2=4-8y^3$

$y=\sqrt[3]{\frac{(x-1)^2-4}{-8}}$

4. Label each as even, odd or neither.

a) $y=x^4+x^2+1$ EVEN

$y=(-x)^4+(-x)^2+1$

$y=x^4+x^2+1$

b) $y=3x^5-x+7$ NEITHER

$y=3(-x)^5-(-x)+7$

$y=-3x^5+x+7$

c) $y=\frac{2x^3}{x^5-x}=\frac{2(-x)^3}{(-x)^5-(-x)}$

$=\frac{-2x^3}{-x^5+x}=\frac{-1(2x^3)}{-1(x^5-x)}$ EVEN

5. Solve $\left(\frac{3}{x}-\frac{x}{2}=2\right)\frac{2x}{1}$

$6-x^2=4x$

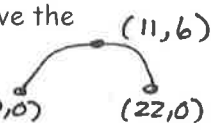
$0=x^2+4x-6$

$x=\frac{-4\pm\sqrt{16-(-24)}}{2}$

$x=-2\pm\frac{\sqrt{40}}{2}$ ← $\frac{2\sqrt{10}}{2}$

$x=-2\pm\sqrt{10}$

6 Write an equation for the path of the ball where Aliyah throws the basketball 22 feet down court with a maximum height (above the starting ht) of 6 feet.



$y=a(x-11)^2+6$

$0=a(22-11)^2+6$

$-6=121a\rightarrow a=\frac{-6}{121}$

$y=\frac{-6}{121}(x-11)^2+6$

7. Find the intersection of $f(x)=x-3$ and $g(x)=x^2-5x-10$

$x^2-5x-10=x-3$

$x^2-6x-7=0$

$(x-7)(x+1)=0$

$x=7$, $y=4$ or $x=-1$, $y=-4$

8. Convert $f(x)=x^2+6x-3$ into graphing form.

$y=x^2+6x+\underline{9}-3-\underline{9}$

$y=(x+3)^2-12$

9. Solve $3(m-4)^2-7=68$

$(m-4)^2=25$

$m-4=\pm5$

$m=4\pm5$

$m=9$ or $m=-1$

10. Solve $4\sqrt{9-x}-7=33$

$\sqrt{9-x}=10$

$9-x=100$

$-91=x$

11. Find the vertex of the function $f(x)=(x+4)(x-12)$

$0=(x+4)(x-12)$

x-int: $x=-4$ or 12

Average x-int: $\frac{-4+12}{2}$

Plug in y= ← $x=4$

$y=(4+4)(4-12)\rightarrow y=-64$

vertex $(4,-64)$

12. Write an absolute value graph with vertex (-4, 6) passing through the point (-2, 2)

$y=a|x+4|+6$

$2=a|-2+4|+6\rightarrow a=\frac{-4}{2}$

$y=-2|x+4|+6$

13. Solve $3|5x-7|+1=31$

$|5x-7|=10$

$5x-7=10$ or $-5x+7=10$

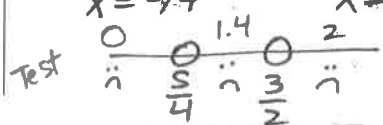
$x=\frac{17}{5}$ $x=\frac{-3}{5}$

14. Solve $|5x-7|<x-2$

$5x-7=x-2$ or $-5x+7=x-2$

$4x=5$ $9=6x$

$x=5/4$ $x=3/2$



No Solution

15. Find the largest angle of ΔABC if a=2, b=3, c=4

$4^2=2^2+3^2-2(2)(3)\cos C$

$C=\cos^{-1}(-.25)$

$C\approx104.48°$

16. The chance of getting a "free pass" is 0.3. What is the probability of getting exactly 4 free passes in 10 attempts?

$_{10}C_4 (.3)^4 (.7)^6$

$\approx$ .2001

17. Sofie earns $1000 a month for random jobs. Each month her salary increases by 8%. Write the equation that models this situation. What would her salary be after working for a year?

$y = 1000(1.08)^x$

if $x = 12$

$y \approx \$2518.17$

18. Kylie earns $1000 a month for random jobs. Each month her salary increases by $108. Write the equation that models this situation. What would her salary be after working for a year?

$y = 1000 + 108x$

if $x = 12$

$y = \$2296$

19. What is the equation of a line passing through (2, -7) and (-3, 3).

$m = \frac{\Delta y}{\Delta x} = \frac{10}{-5} \rightarrow m = -2$

$y = -2x + b$

$-7 = -2(2) + b \rightarrow b = -3$

$y = -2x - 3$

20. Solve $x^2 + 3x \le 10$

$x^2 + 3x - 10 \le 0$

$(x+5)(x-2) = 0$

21. Solve $\begin{cases} 3x - 2y = 6 \\ y = -\frac{1}{2}x + 4 \end{cases}$

$3x - 2\left[-\frac{1}{2}x + 4\right] = 6$

$3x + x - 8 = 6$

$4x = 14$

$x = 3.5$

$y = -\frac{1}{2}\left(\frac{7}{2}\right) + 4$

$y = -\frac{7}{4} + \frac{16}{4}$

$y = 2.25$

22. Three cans of soda and two bags of chips cost $5.35. Two cans of soda and four bags of chips cost $6.90. What is the cost of the chips? ← y

$2(3x + 2y = 5.35)$

$-3(2x + 4y = 6.90)$

$y = \$1.25$

$+6x + 4y = 10.70$

$-6x - 12y = -20.70$

$-8y = -10$

23. Put in graphing form.

$x^2 + 4x + y^2 - 8y - 12 = 0$

$x^2 + 4x + 4 + y^2 - 8y + 16 = 12 + 20$

$(x+4)^2 + (y-4)^2 = 32$

24. Write an equation of an exponential function that passes through the points (1, 16) and (3, 10.24).

$16 = a \cdot b^1 \rightarrow a = \frac{16}{b} \rightarrow a = 20$

$10.24 = a \cdot b^3 \rightarrow 10.24 = \frac{16}{b} \cdot b^3$

$16b^2 = 10.24$

$b = 0.8$

$y = 20(0.8)^x$

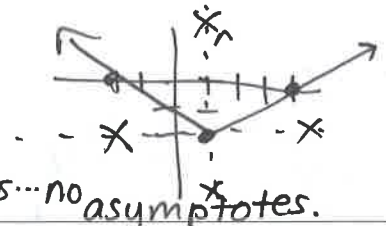
25. Solve $5^x = 20$

$x \cdot \log 5 = \log 20$

$x = \frac{\log 20}{\log 5}$

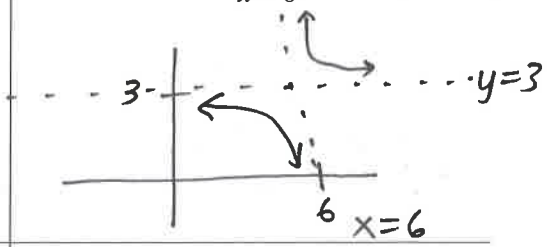
$x \approx 1.8614$

26. Sketch $y = \frac{2}{3}|x-1| - 2$ (1, -2)

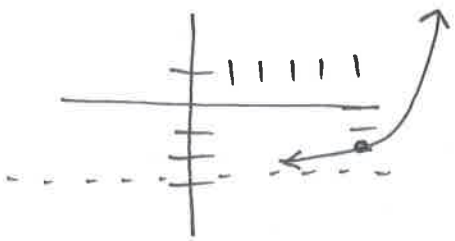


oops... no asymptotes.

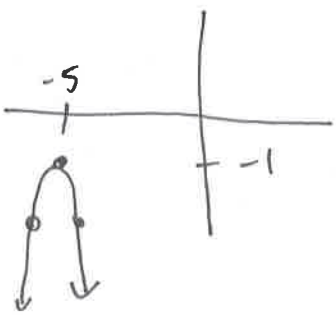
27. Sketch $y = \frac{1}{x-6} + 3$ (6, 3)



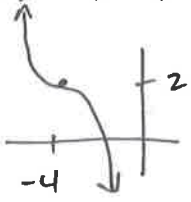
28. Sketch $y = 2^{x-5} - 3$



29. Sketch $y = -2(x+5)^2 - 1$ (-5, -1)



30. Sketch $y = -(x+4)^3 + 2$ -4, 2



31. Find the domain of $f(x)=\frac{\sqrt{7-x}}{x-15}$

$x \geq 7$, $x \neq 15$

$[7,15) \cup (15,\infty)$

32. Sketch $y=\log_2(x+3)-2$. Find the domain and x-int.

$x > -3$

$0 = \log_2(x+3) - 2$

$2 = \log_2(x+3)$

$2^2 = x+3 \rightarrow x = 1$

33. Given 1 (4) 5 | 9 (7) 10. Find the interquartile range.

Q_1 Q_2 Q_3

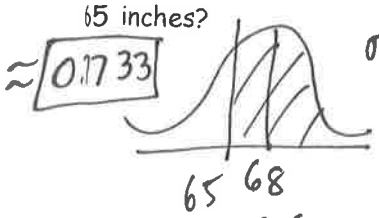
$IQR = Q_3 - Q_1$

$IQR = 7-4$

$IQR = 3$

34. Height is normally distributed. If the average man is 68 inches with a standard deviation of 4 inches, what is the probability you randomly choose a man taller than 65 inches?

$\sigma = 4$



≈ 0.7733

normalcdf(65, 10^99, 68, 4)

35. Solve $\log_2(x-5)+\log_2(x+1)=3$

$\log_2[x^2-4x-5] = 3$

$2^3 = x^2-4x-5$

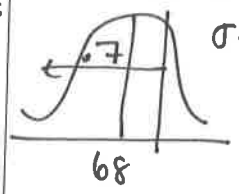
$0 = x^2-4x-13$

$x = \frac{4 \pm \sqrt{16-(-52)}}{2}$ ($\sqrt{68}$)

$x = \frac{4 \pm 2\sqrt{17}}{2} \rightarrow 2 \pm \sqrt{17}$

36. Height is normally distributed. If the average man is 68 inches with a standard deviation of 4 inches, what is the height of a man representing the 70th percentile?

$\sigma = 4$



≈ 70.10"

invNorm(.7, 68, 4)

37. Solve $\log_7(x+3)+\log_7(x-2)=\log_7(14)$

$\log_7(x^2+x-6) = \log_7(14)$

$x^2+x-6 = 14$

$x^2+x-20 = 0$

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

$x = -5$, $x = 4$

38. Solve $\log_2(2x-3)-\log_2(5)=4$

$\log_2 \frac{2x-3}{5} = 4$

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

$2x-3 = 80$

$2x = 83$

$x = \frac{83}{2}$

39. What is f(g(x)) if $f(x)=5x-2$ and $g(x)=\frac{1}{7-x}$

$= 5\left(\frac{1}{7-x}\right) - 2$

$= \frac{5}{7-x} - 2$

40. How many distinct 4 digit ID numbers can be given?

$10 \cdot 10 \cdot 10 \cdot 10$

10,000

41. How many different ways can three person committees be selected from 8 people?

${}_8C_3 = 56$

42. How many different ways can ways can first, second and third places in a race of 10 people?

$10 \cdot 9 \cdot 8 = 720$

OR

${}_{10}P_3$

41. How many solutions does ΔABC have if a = 15 b = 11 and angle A = 35°

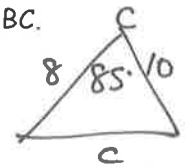
$\frac{\sin 35}{15} = \frac{\sin B}{11}$

1

$B_1 \approx 24.87°$

if tried... $B_2 = 180 - B_1$, $B_2 = 155° + 35$, 190

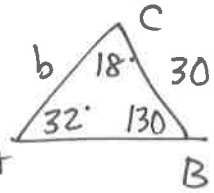
42. Find c if b= 10, a= 8 and C=85° in ΔABC.



$c^2 = 8^2 + 10^2 - 2(8)(10)\cos 85$

$c \approx 12.25$

43. Given ΔABC, find b when a=30, A=32° and C=18°



$\frac{\sin 32}{30} = \frac{\sin 130}{b}$

$b \approx 43.37$