Algebra 2 Semester Two Review

1. $(x^2 - 3x^4 + 5x - 1) + (8 - 2x^4 + 7x^3)$

$-5x^4 + 7x^3 + x^2 + 5x + 7$

2. $(7x^5 - 3x^2 + 2x) - (8x + 1 - 4x^2)$

$7x^5 + x^2 - 6x - 1$

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

$x^2 - 3x + 4$

$2x - 3$

$-3x^2 + 9x - 12$

$2x^3 - 6x^2 + 8x$

$2x^3 - 9x^2 + 17x - 12$

4. $(x^5 + 6x^4 + 3x^2 + 27x + 64) \div (x + 6)$

$x + 6 = 0$

$-6 \quad -6$

$x = -6$

	1	6	0	3	27	64
-6	↓	-6	0	0	-18	-54
	$1x^4$	0	0	3x	9	r10

$1x^4 + 3x + 9 + \frac{10}{x+6}$

For #5-6, state the end behavior.

5. $f(x) = x^{14} - 3x^7 + 6x - 4$

As $x \to +\infty$, $f(x) \to +\infty$

As $x \to -\infty$, $f(x) \to +\infty$

6. $f(x) = -x^7 + 3x - 4$

As $x \to +\infty$, $f(x) \to -\infty$

As $x \to -\infty$, $f(x) \to +\infty$

Factor:

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

Pull out the GCF.

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

Difference of squares

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

8. $5x^2 - 5x - 30 = 0$

$5(x^2 - x - 6) = 0$

$5(x-3)(x+2) = 0$

9. $x^2 - 169 = 0$

Difference of squares

$(x+13)(x-13) = 0$

10. $x^3 - 5x^2 + 3x - 15 = 0$ Factor by grouping

$x^2(x-5) + 3(x-5) = 0$

$(x^2+3)(x-5) = 0$

$(x^3 + 3x^2)(-4x - 12)$

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

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

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

11. $f(x) = x^3 + 3x^2 - 4x - 12$

Zeros: -2, 2, -3 ← You can see these on the graph. Use your calculator.

Factored Form: $(x+2)(x-2)(x+3)$

y-intercept: $(0, -12)$ ⇒ Let $x = 0$

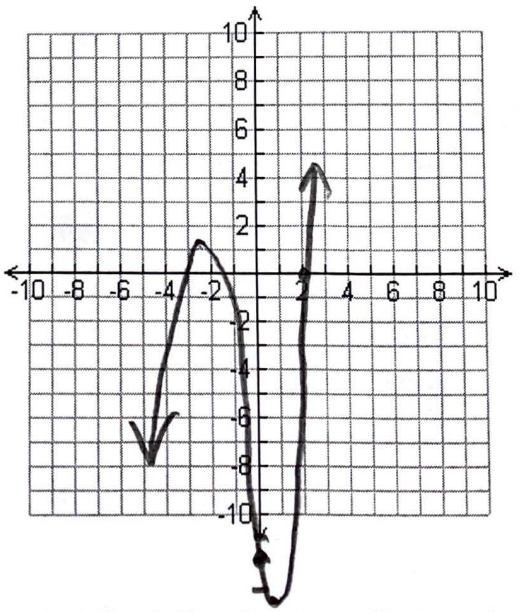
Local Max: $(-2.53, 1.13)$

Local Min: $(0.528, -13.1)$

End Behavior:

As $x \to +\infty$, $f(x) \to +\infty$

As $x \to -\infty$, $f(x) \to -\infty$



12. Convert the following to radian angle measures; leave your answer in terms of π, simplify all fractions. Same as in-class review

a. 270°

d. $\frac{\pi}{4} \cdot \frac{180^\circ}{\pi} = 45^\circ$

e. $\frac{5\pi}{8} \cdot \frac{180^\circ}{\pi} = \frac{225^\circ}{2} = 112.5^\circ$

14. Use the equation below to answer the following questions.

$$y = \frac{4}{2}\cos\left(\frac{1}{4}x\right) + 3$$ "cup"

a. Determine the amplitude of the function. How is it related to the equation? 4/2

b. Determine the period of the function. How is it related to the equation? up 2 / down 2

$\frac{1}{4}x = 0$ → $x = 0$

$\frac{1}{4}x = 2\pi$

→ $x = 2\pi \cdot \frac{4}{1} = 8\pi$

$0 \to 8\pi$ The graph is stretched

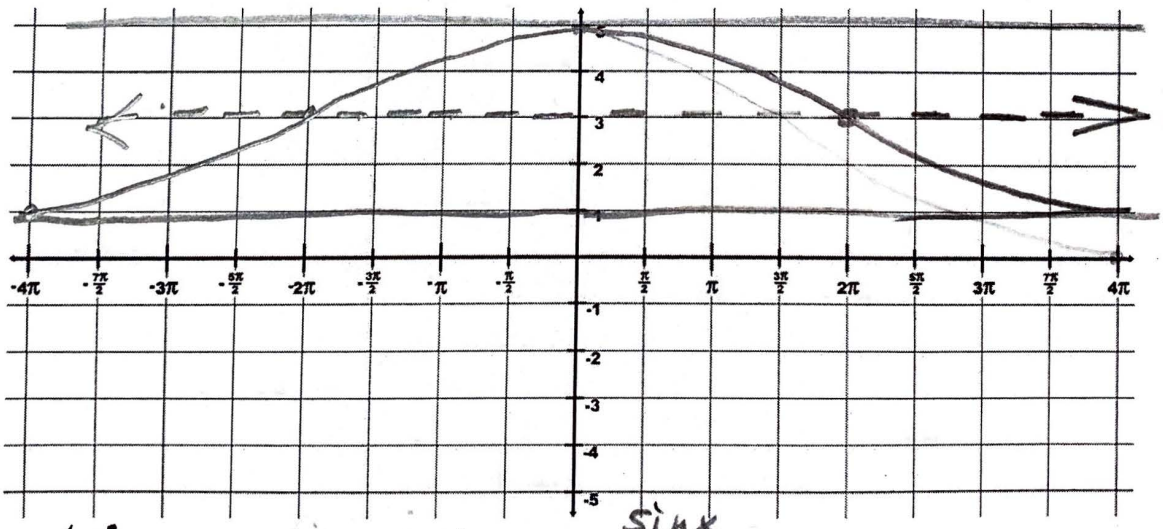
c. Determine the midline of the function. How is it related to the equation?

$y = 3$

d. Find the domain of the function. $(-\infty, \infty)$

e. Find the range of the function. $[1, 5]$

f. Graph at least 1 cycle of the function.



$\cos^2 x + \sin^2 x = 1$ and $\tan x = \frac{\sin x}{\cos x}$

15. Find sinx and tanx if cosx = $^2/_3$ and angle x is in quadrant IV. → Quad 4 means cos +, sin −, tan −

$\left(\frac{2}{3}\right)^2 + \sin^2 x = 1$

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

$-\frac{4}{9} \quad -\frac{4}{9}$

$\sqrt{\sin^2 x} = \sqrt{5/9}$

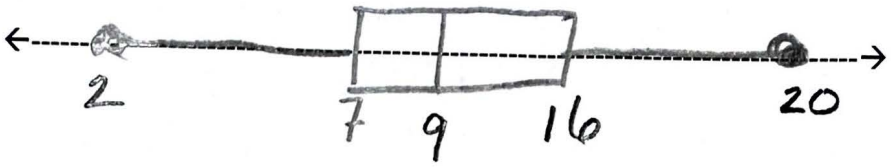
$\sin x = -\frac{\sqrt{5}}{3}$

$\tan x = \frac{-\frac{\sqrt{5}}{3}}{\frac{2}{3}}$

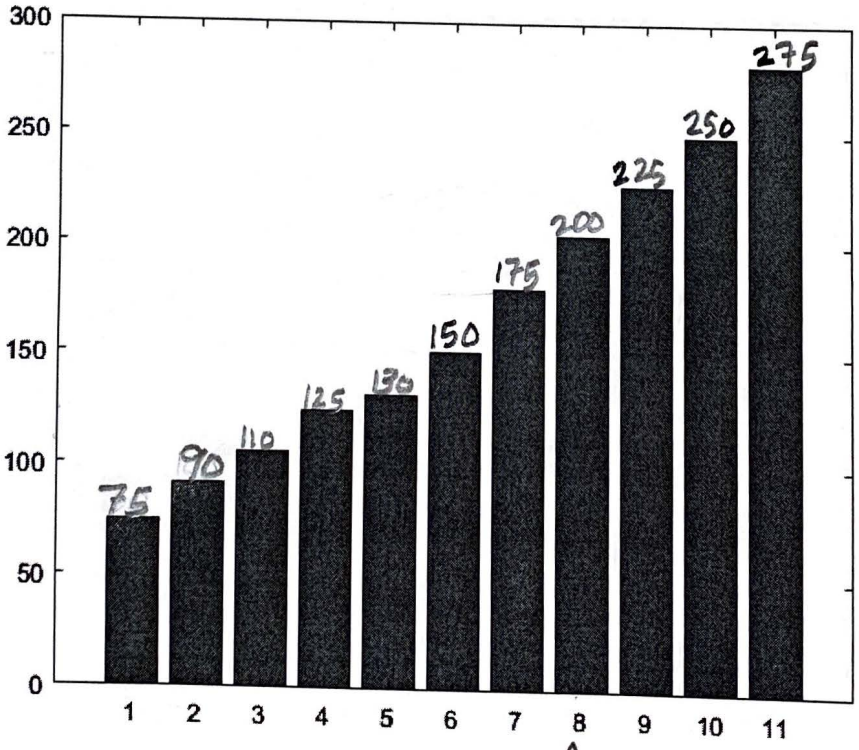
$\tan x = -\frac{\sqrt{5}}{3} \cdot \frac{3}{2} = -\frac{\sqrt{5}}{2}$

17. Make a box and whisker graph to represent the data:

{ 14, 5, 3, 13, 7, 9, 9, 2, 16, 7, 7, 16, 19, 20}



18. Use the graph to find the mean, median, and mode.



Mean:

1(75)+2(90)+3(110)+4(125)
+5(130)+6(150)+7(175)+
8(200)+9(225)+10(250)+
11(275) = 13010

13010/1805 = 7.20776

Median: 8

1805 ÷ 2 + 0,5

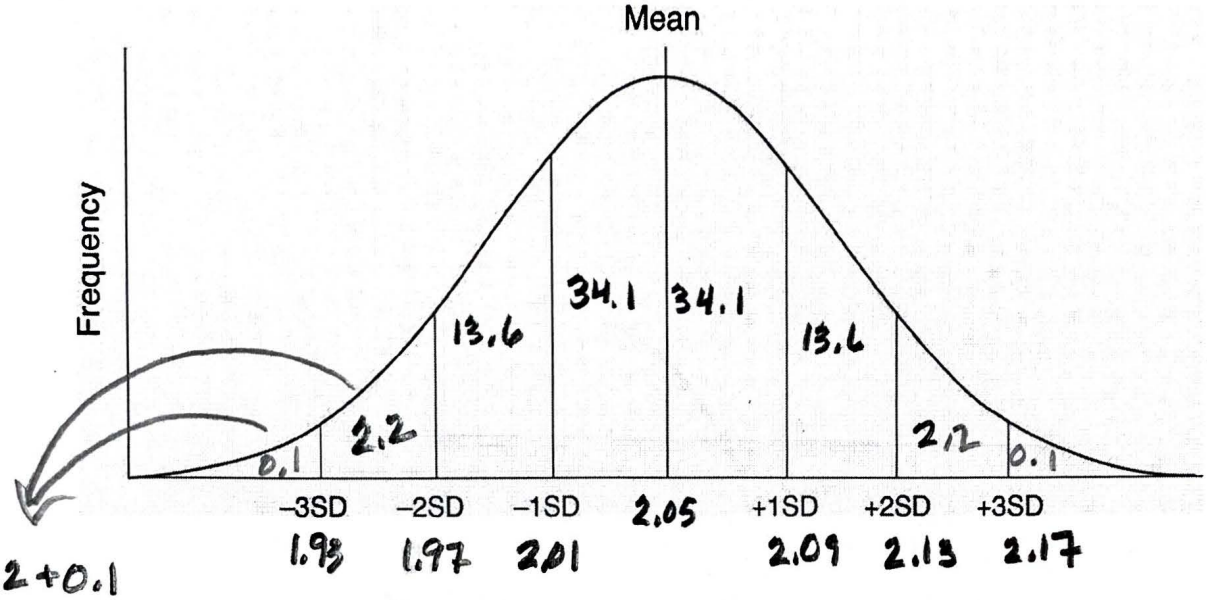
= 903

This would be in bar 8.

Mode: 11

highest bar

19. Use normal distribution to solve. The price of a gallon of gas at 75 gas stations has a mean of $2.05 and a standard deviation of 4 cents. What percent of gas stations sell a gallon of gas for less than $1.97? How many gas stations sell a gallon of gas for less than $1.97?



2.2+0.1
= 2.3% sell gas for less than 1.97.

(0.023)(75) = 1.725 ⇒ Fewer than 2 stations sell gas for less than # 1.97.

20. Use the table below to calculate probability.

EYE COLOR	Black	Brown	Blue	Green	Gray	Total
Female	20	30	10	15	10	85
Male	25	15	12	20	10	82
Total	45	45	22	35	20	167

P(brown) = $\frac{45}{167}$

P(female or blue) = $\frac{85+22-10}{167} = \frac{97}{167}$

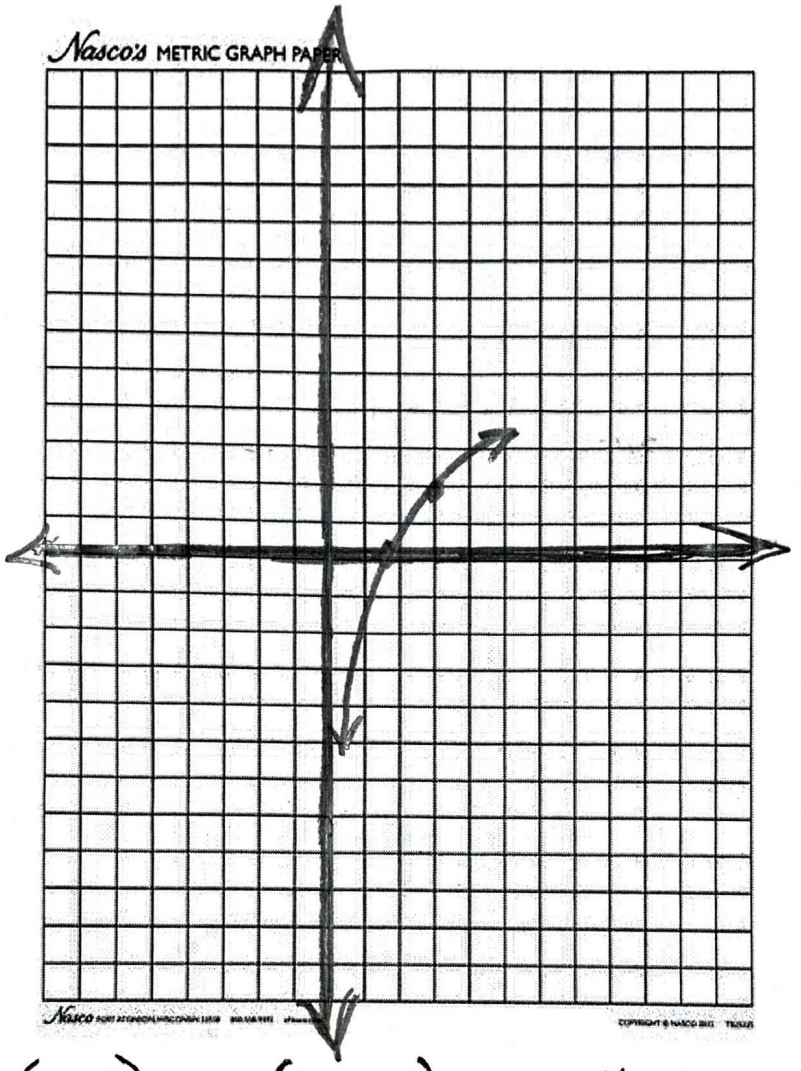
P(blue or green) = $\frac{22+35}{167} = \frac{57}{167}$

P(male and green) = $\frac{20}{167}$

P(greylmale) = $\frac{10}{82} \Rightarrow \frac{5}{41}$

P(female and grey) = $\frac{10}{167}$

21. Graph the function: $f(x) = 2\log_3 x - 1$.



$0 = 2\log_3 x - 1$

$+1 \quad +1$

$\frac{1}{2} = \frac{2\log_3 x}{2}$

Domain: $(0, \infty)$ Range: $(-\infty, \infty)$ Asymptote: $x = 0$ x-intercept: (1.732050)

$3^{1/2} = x$

x -> $+\infty$ as f(x) -> + infinity x -> 0 as f(x) ->- infinity

22. Solve: $3 \cdot 4^{2x} - 1 = 20$

$+1 \quad +1$

$\frac{3 \cdot 4^{2x}}{3} = \frac{21}{3}$

$\log_4 4^{2x} = \log_4 7$

$2x = \log_4 7$

$\frac{2x}{2} = \frac{1.403678}{2}$

$x = 0.701839$

$\log(3x+2) = 10$

$10^{\log 3x+2} = 10^{2}$

$3x + 2 = 100$

$-2 \quad -2$

$3x = 98$

$x = 32.6$