Math 375
Spring 2026
Exam 4, May 1

No books, notes, scratch paper, phones.
Please show all your work and clearly mark your answers.
Problems are 10 points unless noted.
If a problem is too hard, move on to an easier one.
No calculators on problems 1-7.

Page	Pts	Possible
1		15
2		10
3		10
4		20
5		5
6		20
7		20
Total		100

Name (printed): Key

Name (signature): _____

Score for the class so far: _____ out of _____ points

Percent: _____ % Approximate letter grade:

To earn a grade of I would need about
of the points in the rest of the class.

1) Define monomial. (5 points)

A real number times x raised to a whole number power.

2) Find all solutions of:

$2x^3 - 5x^2 - 7x - 20 = 0$

Note: One solution is $x = 4$.

$$\begin{array}{r|cccc} 4 & 2 & -5 & -7 & -20 \\ & & 8 & 12 & 20 \\ \hline & 2 & 3 & 5 & 0 \end{array}$$

$$2x^2 + 3x + 5 = 0$$

$$x = \frac{-3 \pm \sqrt{9 - 40}}{4}$$

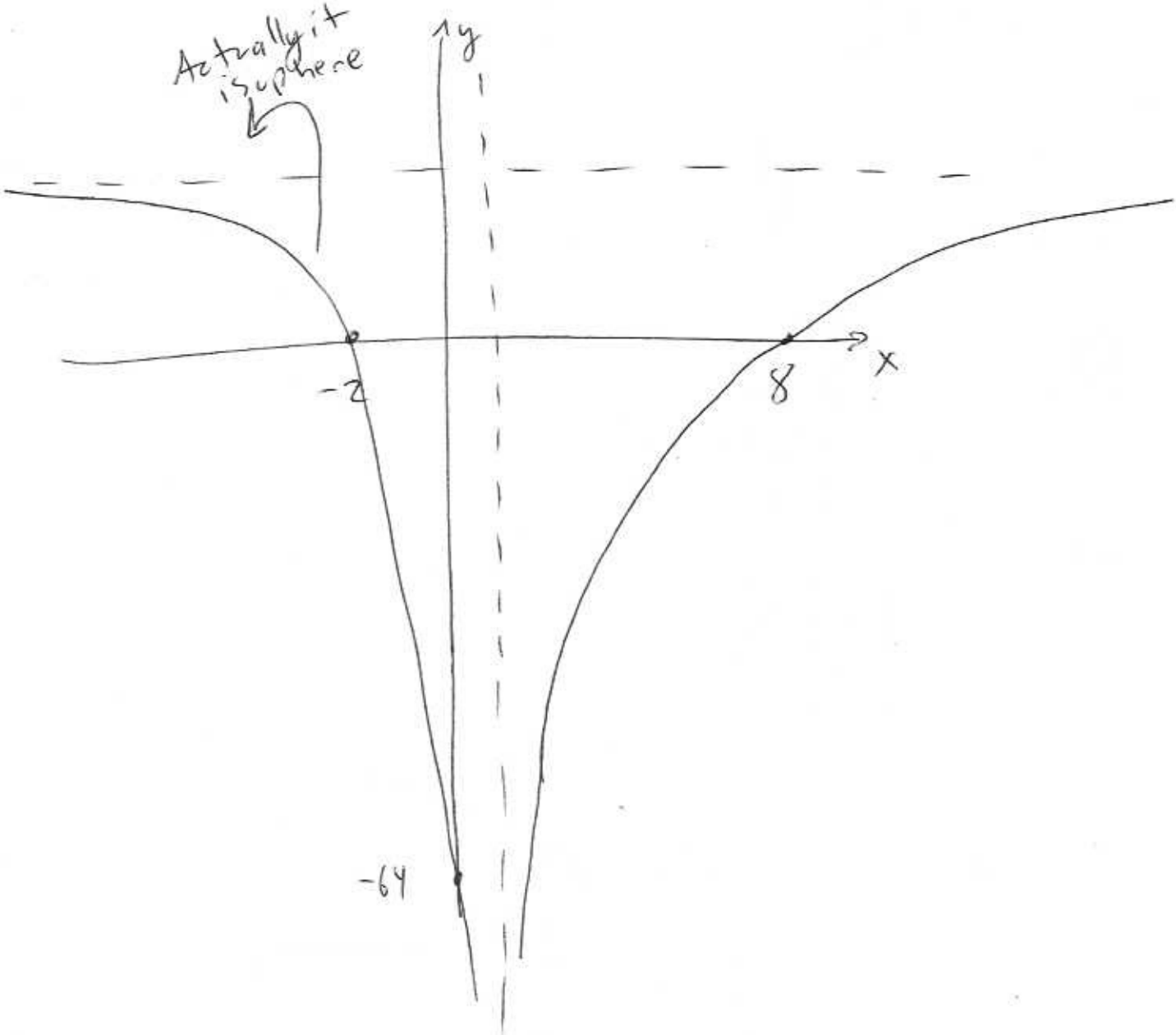
$$= \frac{-3 \pm i\sqrt{31}}{4}, \text{ or } 4$$

3) Graph $y = \frac{4x^2-24x-64}{x^2-2x+1}$. Hint: Factor top and bottom.

$y = \frac{4(x^2-6x-16)}{(x-1)^2} = \frac{4(x-8)(x+2)}{(x-1)^2}$

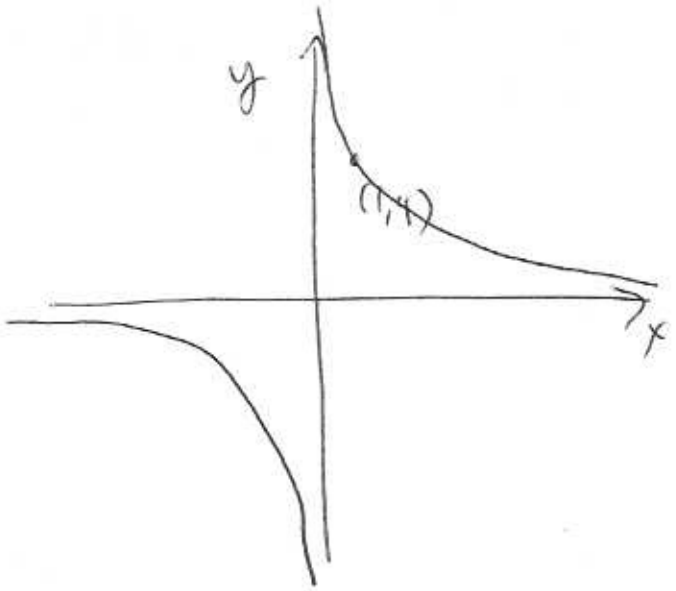
HA: $y = 4$

y-int = -64

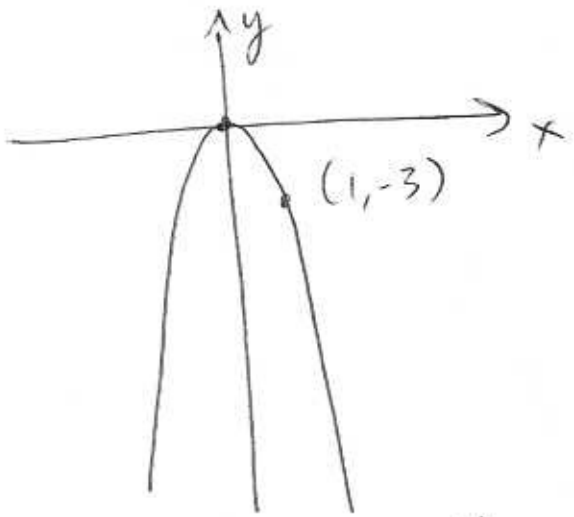


4)a) Graph $y = 4x^{-3}$
b) Graph $y = -3x^4$
c) Graph $y = x^{3/4}$
Use separate coordinate systems. Graph each on it entire real domain, and label at least one point for $x > 0$ for each graph.

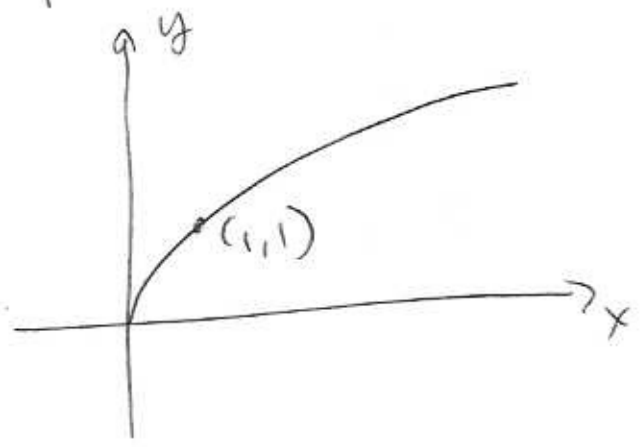
a)



b)



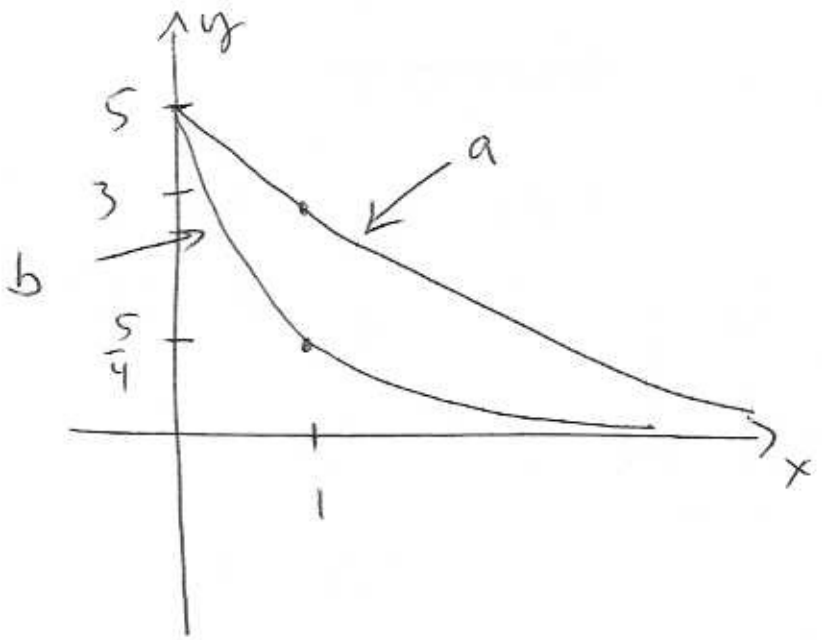
c)



5) Graph on the same coordinate system. Be sure to label which is which. Graph for $x \geq 0$ only.

a) $y = 5(0.6)^x$

b) $y = 5(4)^{-x}$



6) Find the determinant of these matrices:

a)

$$\begin{vmatrix} 3 & 4 \\ 1 & -5 \end{vmatrix} \qquad -15 - 4 = -19$$

b)

$$\begin{vmatrix} 1 & 2 & -1 \\ 0 & 3 & 4 \\ -2 & 0 & 1 \end{vmatrix} \qquad 1(3-1) - 2\begin{vmatrix} 0 & 4 \\ -2 & 1 \end{vmatrix} + (-1)\begin{vmatrix} 0 & 3 \\ -2 & 0 \end{vmatrix}$$

$$= 3 - 2(0 + (+8)) + (-1)(0 + (+6))$$

$$= 3 - 16 - 6 = -19$$

7) Solve the system: (only 5 points though)

$$\begin{cases} x + 3y + z = 17 \\ 2x - 4y - z = -4 \\ 3x + y + 2z = 29 \end{cases}$$

~~2x + 6y + 2~~

$4x - 8y - 2z = -8$

$3x - y = 13$

$3x + y + 2z = 29$

$x - y = 3$

$7x - 7y = 21$

$x - y = 3$

$2x = 10$

$x = 5$

$y = 2$

$z = 6$

~~5 + 11 + 2 = 17~~

$5 + 6 + z = 17$

Eq 1 $5 + 6 + 16$

Eq 2 $10 - 8 - 6$ ✓

Eq 3 $15 + 2 + 12$ ✓

Name:

8)a) Find the money in an account at the end of 10 years if $14,000 is invested at 3.23% interest compounded 4 times per year.
b) Find the money in an account at the end of 10 years if $14,000 is invested at 3.23% interest compounded continuously.

a) $19312.65

b) $19337.71

9) You begin the year with 239 followers on your social media. This number doubles every 7 months.
a) Find an exponential model.
b) Find the number of followers you have after 3 years. (Convert to months first!)

$N(t) = 239 \cdot 2^{\frac{t}{7}}$

$N(36) = 8444$ followers

10) Solve and write to 3 decimal places. Show work pls.

a) $(8)^{2x} = 100{,}000$

b) $\log_6(3x + 1) = 0.932$

a) $\log_{10}(8^{2x}) = 5$

$2x \log_{10}(8) = 5$

$x = \dfrac{5}{2\log_{10}(8)} = 2.769$

b) $6^{0.932} = 3x + 1$

$x = \dfrac{6^{0.932} - 1}{3}$

$x = 1.437$

11) A basketball team scores 1,501 points on 267 free throws (one point each) and 585 baskets. How many two-point baskets and how many three-point baskets are made? Show work including setting up one or more relevant equations.

x = # of 2pts baskets

y = # of 3pt baskets

$x + y = 585$

$267 + 2x + 3y = 1501$

$2x + 3y = 1234$

$2x + 2y = 1170$

$y = 64$

$x = 521$