

<u>9/11/08</u>	
cheese	6
pepp	10
saus.	6
pineapple.	6
mush.	12

<u>order</u>	
11	2
111	3
1	1
11	2
11	2

$$10 @ 7$$

$$= \$70$$

\$7.50

17

9/15/08

cheese
pep
saus.
pine.
mush.

order

1
111

\$66.07

2008-2009 school year
Pizza orders,
Sign in sheet + receipt
copies

$$8 \times 7 = 54$$

$$\begin{array}{r} + 4 \\ \hline 58 \end{array}$$

9/28/08

cheese 2 4
pepp 2 2
saus. 5
pineapple 3
mushroom a lot
chicken a lot

16

11
11

10/27/08

15
1

order

\$66.07

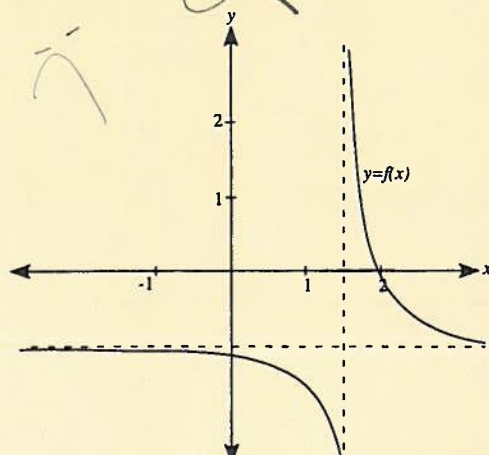
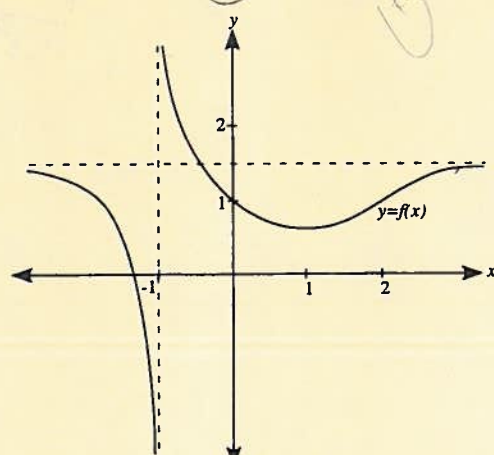
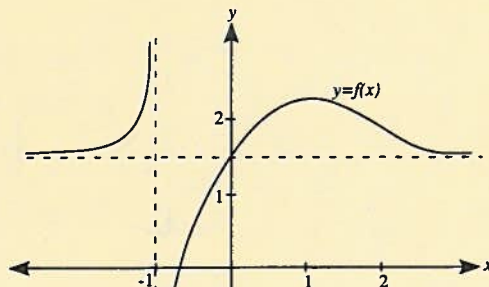
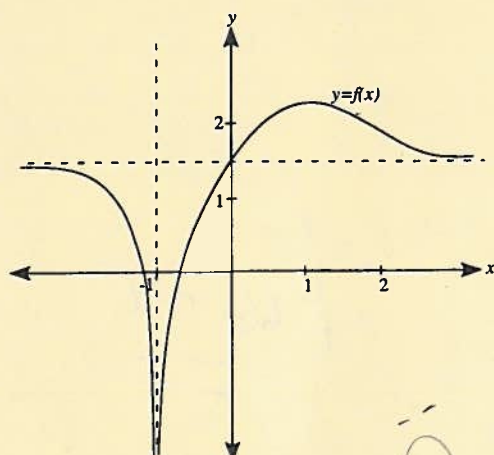
cheese
saus
pineapple
mush
chicken

1
1
11
11
11

13. The function $y = f(x)$ satisfies the following properties:

- $f(x)$ has a vertical asymptote at $x = -1$
- $f(x)$ has a horizontal asymptote at $y = 1.5$
- $f'(x) < 0$ on $(-\infty, -1)$ and $(1, \infty)$, and $f'(x) > 0$ on $(-1, 1)$
- $f''(x) < 0$ on $(-\infty, -1)$ and $(-1, 2)$, and $f''(x) > 0$ on $(2, \infty)$.

Which of the graphs labeled (I) through (IV) is the graph of $f(x)$?



(a) graph I

(d) graph IV

(b) graph II

(c) graph III

(e) graphs I and III

11/10/08

19

order

\$74.10

cheese
pineapple
mushroom
chicken
sausage

1
11
11
11
11

12/01/08

order

\$64.99

white
pineapple
mushroom
chicken
sausage

3
2
3
5
1

1
1
11
11
1
7

13

1/26/09

10

order

\$42.00

white
pineapple
mushroom
chicken
sausage

0
0
6
2
3

0
0
2
1
2

2/10/09

22

order

\$81.00

white
pineapple
mushroom
chicken
sausage

2
2
7
3
2

1
1
3
2
2

4/06/09

cheese
white
pineapple
mushroom
chicken
sausage

1
1
2
2
2

x \$66

8

(They no longer
carry white
pizza @ our
Papa John's)

4/20/09

13

cheese
pineapple
mushroom
chicken
sausage

111
111
11111
1111
1111

1
2
2
1
2

8

$$f''(1) = 12(1) - 12(1) + 4 = 4$$

$$f''(x) = 12x^2 - 12x + 4$$

$$f'(x) = 4x^3 - 6x^2 + 4x$$

9. If $f(x) = x^4 - 2x^3 + 2x^2 + 1000$, $f''(1)$ is

(a) 4

(b) 6

(c) 0

(d) 2

(e) -18

10. The graph of the function $f(x)$ is given in Figure 4 below. The points in the open interval $(0, 15)$ where $f(x)$ is **not** differentiable are:

(a) 2, 8, 13

(b) 2, 5, 13

(c) 2, 5, 9, 13

(d) 2, 5, 8, 9, 13

(e) 2, 5

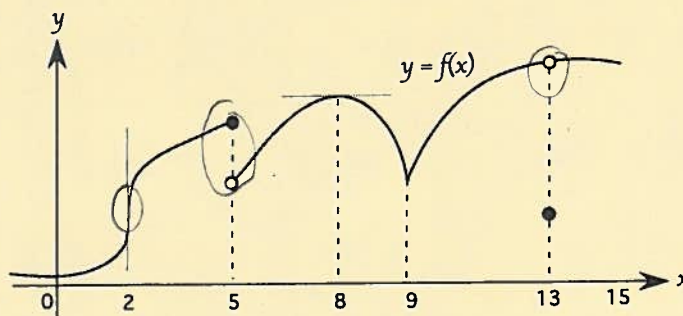


Figure 4

$$\begin{aligned} & 3x^3 - 3x + 3 - 6x^2 + 2 \\ & \frac{3x^3 - 6x^2 - 3x + 5 - 4}{(x^3 + x + 1)^2} \end{aligned}$$

11. Given $f(1) = 2$ and $f'(1) = 3$. Find the derivative of the function $\frac{f(x)}{x^3 - x + 1}$ at $x = 1$.

(a) 1

(b) $-\frac{1}{2}$

(c) 2

(d) -1

(e) 0

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

$$\begin{aligned} & = \frac{3x^3 - 3x + 3 - 6x^2 + 2}{(x^3 - x + 1)^2} \\ & = \frac{(3x^3 - 3x + 3) - 6x^2 + 2}{(x^3 - x + 1)^2} \\ & = \frac{3(x^3 - x + 1) - 6x^2 + 2}{(x^3 - x + 1)^2} \end{aligned}$$

12. Using implicit differentiation, find y' if $y + e^{2y} = 1 + 2e^x$.

(a) $y' = \frac{e^x}{1 + 2e^{2y}}$

(b) $y' = \frac{2e^x}{1 + 2e^{2y}}$

(c) $y' = \frac{2e^x}{1 + e^{2y}}$

(d) $y' = \frac{2e^x}{1 - 2e^{2y}}$

(e) $y' = \frac{2}{1 + 2e^{2y}}$

$$\frac{dy}{dx} + 2\frac{dy}{dx}e^{2y} = 0 + 2e^x$$

$$y + e^{2y} = 1 + 2e^x$$

$$\frac{dy}{dx} + 2\frac{dy}{dx}e^{2y} = 0 + e^x$$

$$\begin{aligned} & \frac{dy}{dx} + 2\frac{dy}{dx}e^{2y} = e^x \\ & \frac{dy}{dx}(1 + 2e^{2y}) = \frac{2e^x}{1 + 2e^{2y}} \end{aligned}$$

GSS - Sept 1, 2008

Steve VanDerDressde

Tiancong Chen

Youngho Yoon

Yuan Lin

Stephen Flood

Richard Geyji

Kevin TUNZ

George Poullos
JACOB CARSON

Bernadette Boyle

Laura Fays

John Engbers

Yueh-Ju Lin

John Harvey

Joshua Lioi

Logan Aron

Brandon Rowekamp

Sarah Cotter

Martha Precup

Jesse Johnson

Megan Patnotz

Stacy Hehn

Bonnie Smith

Unique Order Number 211282

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

30LM

09/01/2008

04:25pm

InStore Order

Name: Don

Restaurant Order #: 0027

Visa

Account #: xxxxxxxxxxxx6369

Authorization #: 001870

Reference #: 66410

Batch ID: 0

Order Amount: 76.75

Tax: 5.37

Total Amount: 82.12

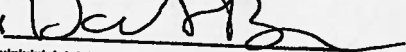
Visa: 82.12

Tip: 9.5

Total: 91.12

Addtl Tender Amt: 0.00

Customer Signature

x 

Customer Copy

Better Ingredients

Better Pizza

QSS - Sept 15, 2008

Jesse Johnson

~~John H~~

JACOB CARSON

Renata TUNC

David Karapetyan

Sarah Cotter

Megan Patnot

John Engberg

Martha Precup

Joshua Liori

F. Cialaz-Garcia

Brandon Rowekamp

John Wallbaum

Bernadette Boyle

Logan Axon

Tom Edgar

Jon Hauenstein

Yueh-Ju Lin

Bonnie Smith

Stephen Flood

Don Brower

Unique Order Number 213271

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

2BRN

09/15/2008

04:25pm

InStore Order

Name: Don

Restaurant Order #: 0020

Visa

Account #: xxxxxxxxxxxx6359

Authorization #: 015264

Reference #: 67299

Batch ID: 0

Order Amount: 61.75

Tax: 4.32

Total Amount: 66.07

Visa: 66.07

Tip:

Total:

Addtl Tender Amt:

Customer Signature

X

Customer Copy

Better Ingredients

Better Pizza

GSS - Sept 29, 2008

Bonnie Smith

Stacy Hoehn

Brandon Rowekamp

Logan Axon

Martha Precup

John Wallbaum

Sarah Cotter

Bernadette Boyle

John Engbers

JACOB CARSON

Yueh-Ju Lin

Jesse Johnson

Star UnderDressh

Demrihan

Angie

Steve Flood

Tiancong

Megan Patnotz

Don Brower

Unique Order Number 214937

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

4SPW

09/29/2008

04:28pm

InStore Order

Name: Megan

Restaurant Order #: 0019

Visa

Account #: xxxxxxxxxxxx6359

Authorization #: 029002

Reference #: 87851

Batch ID: 0

Order Amount: 61.75

Tax: 4.32

Total Amount: 66.07

Visa: 66.07

Tip:

Total:

Addtl Tender Amt:

0.00

Customer Signature

X

Customer Copy

Better Ingredients

Better Pizza

Unique Order Number 218034

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

2BRN

10/27/2008

04:19pm

InStore Order

Name: Megan

Restaurant Order #: 0017

Visa

Account #: xxxxxxxxxxxx6358

Authorization #: 02762A

Reference #: 69123

Batch ID: 0

Order Amount: 61.75

Tax: 4.32

Total Amount: 66.07

Visa: 66.07

Tip:

Total:

6.
\$ 72.07

Addtl Tender Amt: 0.00

Customer Signature

X

Customer Copy

Better Ingredients

Better Pizza

GSS Oct 27, 08

Brandon Ravetkamp

Stacy Hoehn

Bernadette Boyle

Jesse Johnson

Megan Patnot

Stephen Flood

Joshua Lior

Cogan Axon

John Wallbaum

Jon Hauenstein

Martha Precup

Tom Edgar

Richard Geyi

Don Brower

Peritha Turc

Huijing Du

Tiaacang Chen

Yuan Lin

David Kogel

GSS Nov 10, 2008

John Harvey

Steve VanDerDressie

Stephen Flood

Brandon Runkamp

Demetrius Tunc

JACOB CARSON

John Engbers

Jesse Johnson

Sarah Cotter

Martha Preup

Tom Edgar

BONNIE SMITH

Logan Axon

John Wallbaum

Bernadette Boyle

Don Browner

Megan Patrott

Unique Order Number 219720

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

4DER 11/10/2008 04:34pm

InStore Order

Name: Megan

Restaurant Order #: 0026

Mastercard

Account #: xxxxxxxxxxxx3835

Authorization #: 03757Z

Reference #: 68824

Batch ID: 0

Order Amount: 69.25

Tax: 4.85

Total Amount: 74.10

Mastercard: 74.10

Tip:

8.25

Total:

82.35

Addtl Tender Amt:

0.00

Customer Signature

x Megan Rath

Merchant Copy

Better Ingredients

Better Pizza

GSS Dec 1, 08

Megan Patrick

Richard Geiji

Sam Harvey

Jesse Johnson

Jimmy Zhu

John Emphus

Stephen Hall

Josh Jiri

Martha Preaup

Don Brower

JACOB CARSON

Tom Edger

Bernadette Bayle

***** Unique Order Number 222203 *****
Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

3MCW 12/01/2008 04:45pm
***** InStore Order *****

Name: megan

Restaurant Order #: 0010

Mastercard

Account #: xxxxxxxxxxx3835

Authorization #: 05817Z

Reference #: 70961

Batch ID: 0

Order Amount: 80.74

Tax: 4.25

Total Amount: 84.99

Mastercard: 84.99

Tip: 5.01

Total: 70.00

Addtl Tender Amt: 0.00

Customer Signature

X M. Patrick

Customer Copy

GSS Jan 26, 09

Megan Patnotz

John Enckers

Martha Precup

Brandon Rowekamp

Bernadette Boyle

Stacy Hoehn

Tom Edgar

Steven Broad

David Karapetjan

Unique Order Number 228614

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

4PIJ

01/26/2009

04:24pm

InStore Order

Name: Megan

Restaurant Order #: 0022

Mastercard

Account #: xxxxxxxxxxxx3835

Authorization #: 02859Z

Reference #: 73522

Batch ID: 0

Order Amount: 38.25

Tax: 2.75

Total Amount: 42.00

Mastercard: 42.00

Tip:

8.00

Total:

50.00

Addtl Tender Amt: 0.00

Customer Signature

X M. Edgar

Customer Copy

Better Ingredients
Better Pizza

GSS, Feb. 16

Megan Patnett

Gun Sungeekhan

John Wallbaum

John Engbers

Logan Axon

Bonnie Smith

Stephen Flood

Richard Lipp

Huijing Du

Yuan Lin

Tianyang Chong

Bernadette Boyle

Cong Nguyen

Sarah Cotter

Joshua Looi

Martha Precup

Yueh-Ju Lin

Stacy Hehn

Unique Order Number 231087

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

3MCW 02/18/2009 04:45pm

InStore Order

Name: Megan

Restaurant Order #: 0012

Mastercard

Account #: xxxxxxxxxxxx3835
Authorization #: 07614Z
Reference #: 74597
Batch ID: 0
Order Amount: 75.74
Tax: 5.30
Total Amount: 81.04
Mastercard: 81.04

Tip: 90.00
Total: 90.00
Addtl Tender Amt: 0.00

Customer Signature

X Megan Patnett

Customer Copy

Better Ingredients
Better Pizza

Cass, April 6

Steve Wolfenbach

Brandon Ravetkamp

Logan Axon

Jesse Johnson

Stephen Flood

Melissa Tansler

Martha Preaup

John Engbers

John Willhousen

Tom Edgar

Bernadette Boyl

Bonnie Smith

Megan Patnett

Unique Order Number 236344

Thank You For Choosing
Notre Dame Papa John's
Restaurant #0101

3MCN 04/06/2009 04:45pm

Instore Order

Name: Megan

Restaurant Order #: 0016

Mastercard

Account #: xxxxxxxxxxx3836
Authorization #: 034202
Reference #: 76771
Batch ID: 0
Order Amount: 61.75
Tax: 4.32
Total Amount: 66.07
Mastercard: 66.07

Tip:

Total:

71.07

Addtl Tender Amt:

0.00

Customer Signature

X

Customer Copy

Patnett

GSS 4-20-09

Megan Patroff

Jesse Johnson

Sarah Coter

Steve N. Allen

Youngho Yoon

Stephen Flood

Josh Lior

John Engbers

Bernadette Boych

Bonnie Smith

Logan Axon

John Willbaum

Stacy Hoehn

Tom Edgar

David Kerpel

Ryan Grady

Unique Order Number 237914

Thank You For Choosing

Notre Dame Papa John's

Restaurant #0101

4SPW

04/20/2009

04:45pm

InStore Order

Name: Megan

Restaurant Order #: 0011

Mastercard

Account #: xxxxxxxxxxxx3835

Authorization #: 08745Z

Reference #: 77510

Batch ID: 0

Order Amount: 61.75

Tax: 4.32

Total Amount: 66.07

Mastercard: 66.07

Tip: _____

Total: 70.00

Addtl Tender Amt: 0.00

Customer Signature

X _____

Customer Copy

Better Ingredients

Better Pizza

