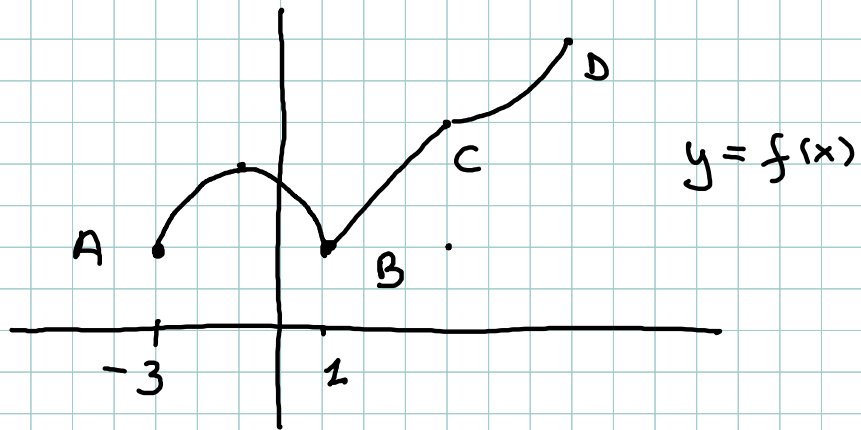


Lesson 18

Chapter 13

Midterm review



A (-3, 2)

B (1, 2)

C (4, 5)

D (7, 7)

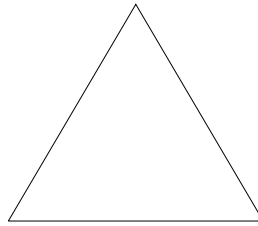
AB semicircle

BC line

CD arc of parabola
with vertex at
C

graph $y = -2f(3x-1) + 5$ end give the multiplier
formula

1. You want to build two enclosures using exactly 3000 feet of fencing. One enclosure will be an equilateral triangle, the other a rectangle. The basis of the rectangle has the same length as the sides of the triangle. What should the side of the triangle be in order to maximize the area of the two combined enclosures ?

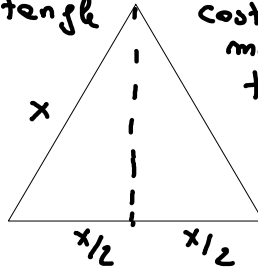
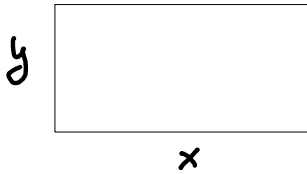


2

2

1. You want to build two enclosures ^{spending} using exactly \$3000 worth of fencing. One enclosure will be an equilateral triangle, the other a rectangle. The basis of the rectangle has the same length as the sides of the triangle. What should the side of the triangle be in order to maximize the area of the two combined enclosures?

The material for building the sides of the rectangle costs \$2 per foot. The material for building the sides of the triangle costs \$3 per foot.



$$\frac{x^2}{4} + h^2 = x^2$$

$$h^2 = \frac{3}{4} x^2$$

$$h = \frac{\sqrt{3}}{2} x$$

$$A = xy + \frac{1}{2} \frac{x}{2} \frac{\sqrt{3}}{2} x$$

How to graph $a f(bx + c) + d$

1. Graph $y = f(x)$

Horizontally :

2. Shift $|c|$ units, left if c is positive, right if c is negative .

3. Scale horizontally of a factor $\frac{1}{|b|}$ (compression if $|b| > 1$, expansion if $|b| < 1$)

4. Reflect across y axis if b is negative . Skip this step if b is positive.

Vertically:

5. Scale by a factor of $|a|$ (compression if $|a| < 1$, expansion if $|a| > 1$)

6. Reflect across x axis if a is negative . Skip this step if a is positive.

7. Shift $|d|$ units, up if c is positive, down if c is negative .

Note: the order is important.

How to graph $a f(b(x + c)) + d$.

1. Graph $y = f(x)$

Horizontally:

2. Scale horizontally of a factor $\frac{1}{|b|}$. (compression if $|b| > 1$, expansion if $|b| < 1$)

3. Reflect across y axis if b is negative. Skip this step if b is positive.

4. Shift $|c|$ units, left if c is positive, right if c is negative.

Vertically:

5. Scale by a factor of $|a|$ (compression if $|a| < 1$, expansion if $|a| > 1$)

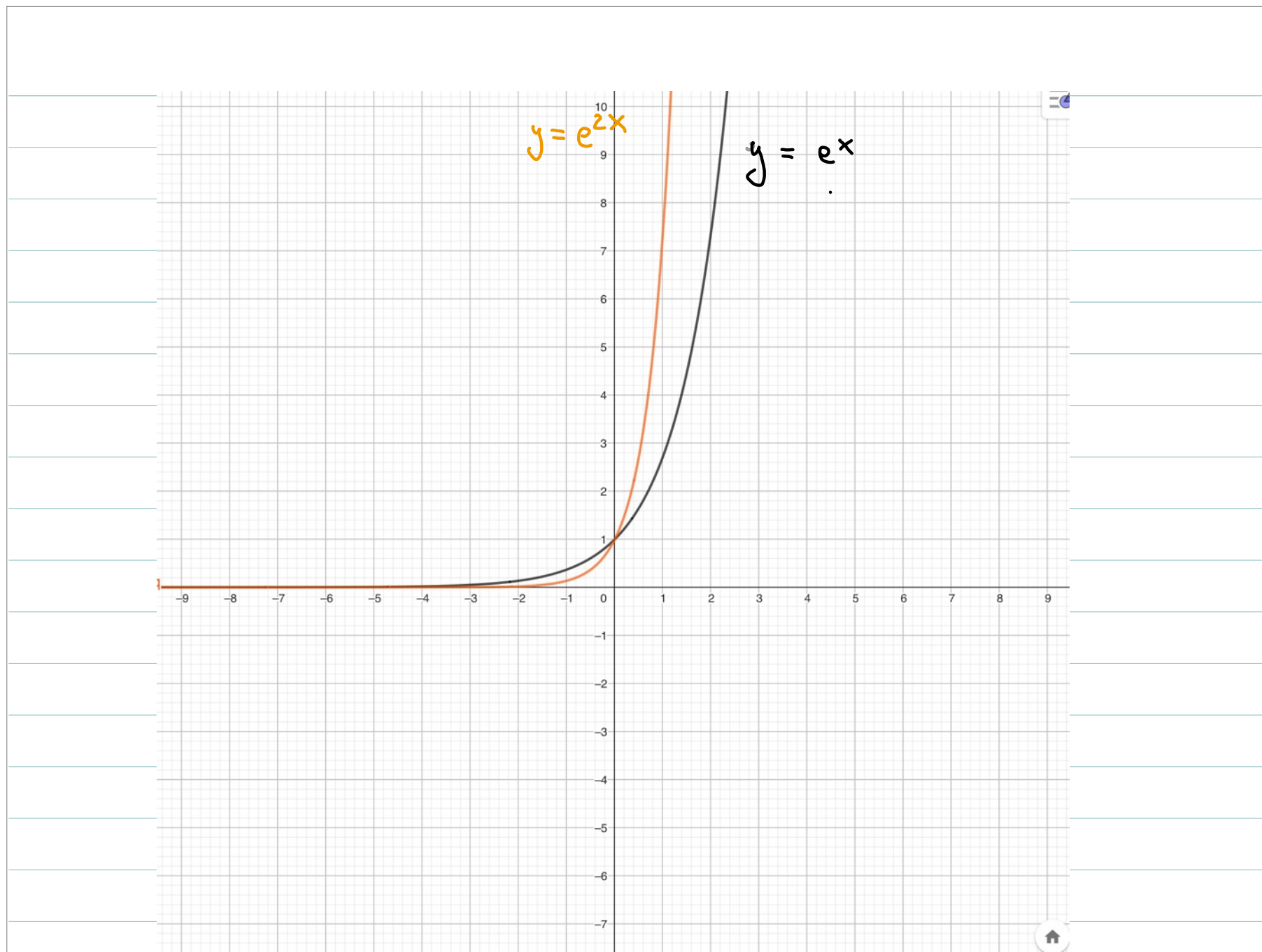
6. Reflect across x axis if a is negative. Skip this step if a is positive.

7. Shift $|d|$ units, up if d is positive, down if d is negative.

Note: the order is important.

Sketch the graph of $g(x) = 3|2x - 5| + 1$

Sketch the graph of $g(x) = 3e^{2(x-5)} + 1$





f is even if $f(x) = f(-x)$.

EX: $\cos x$ is even

f is odd if $f(x) = -f(-x)$.

EX: $\sin x$ is odd