

Lesson 17

Finish Chapter 13. Domain, Range

Read Chapter 15

Angles. Arclength, Area of Wedges

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.

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



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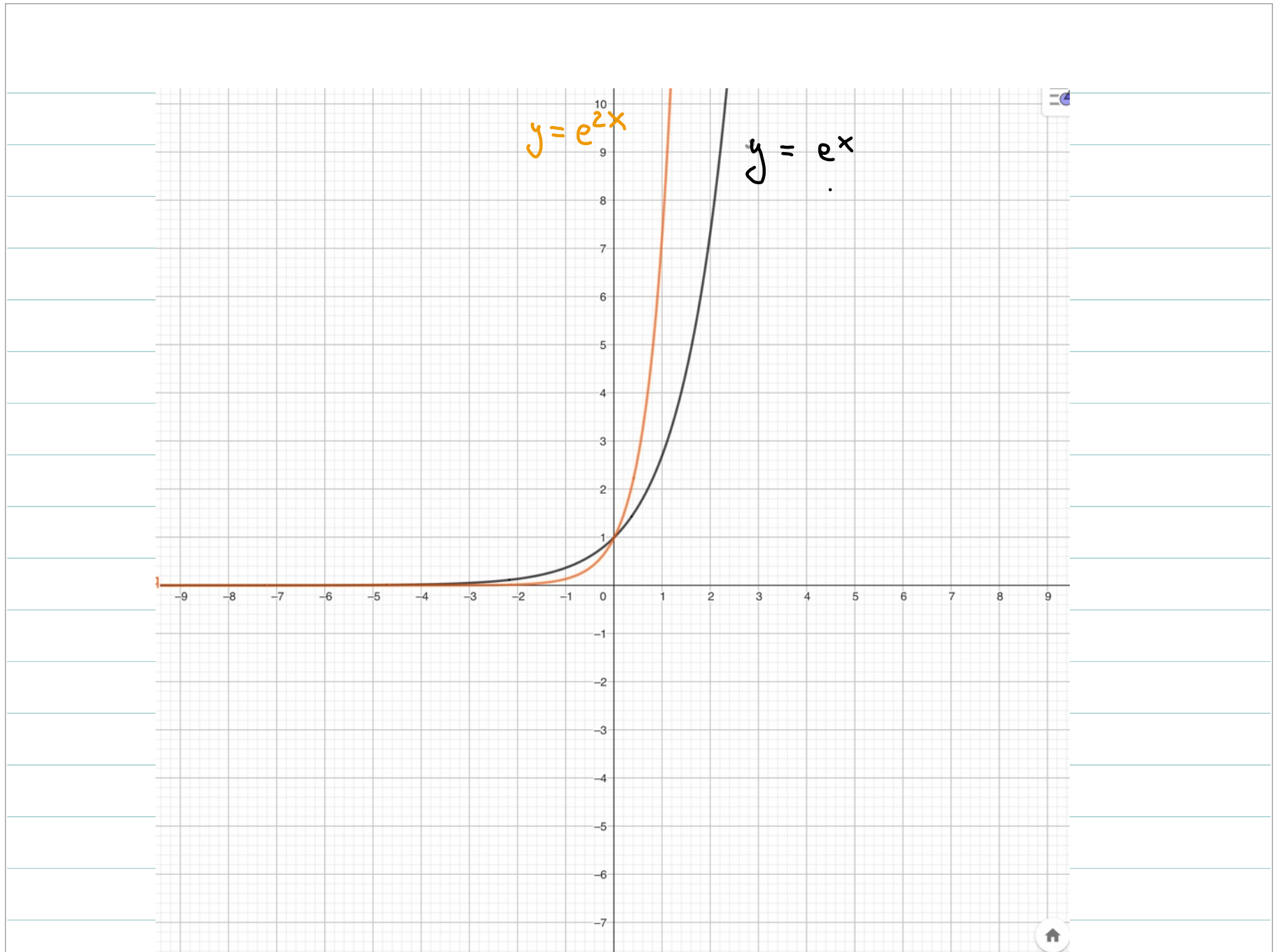
5. Scale by a factor of $|a|$ (compression if $|a| < 1$, expansion if $|a| > 1$)

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

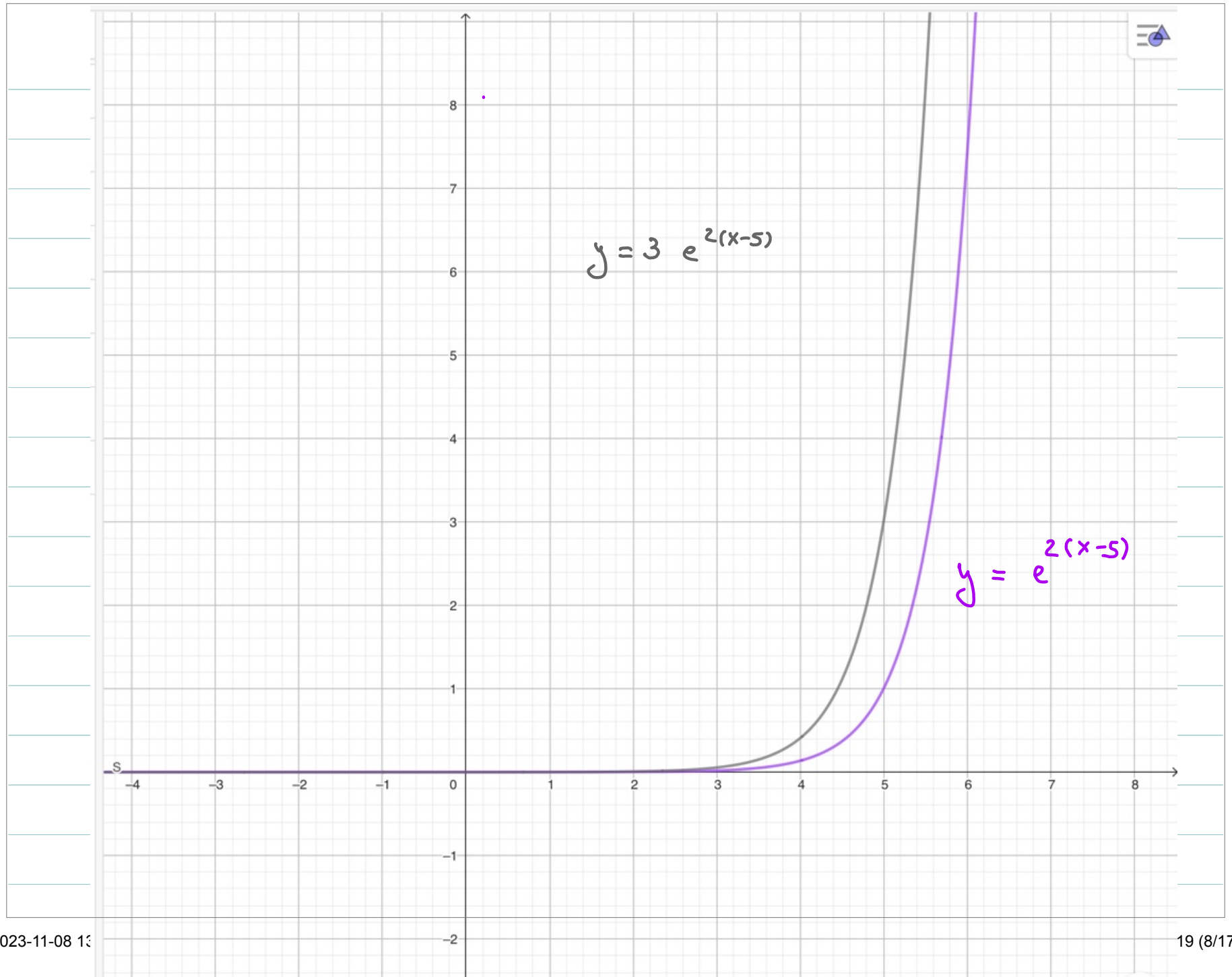
7. Shift $|d|$ units, up if d is positive, down if d is negative.

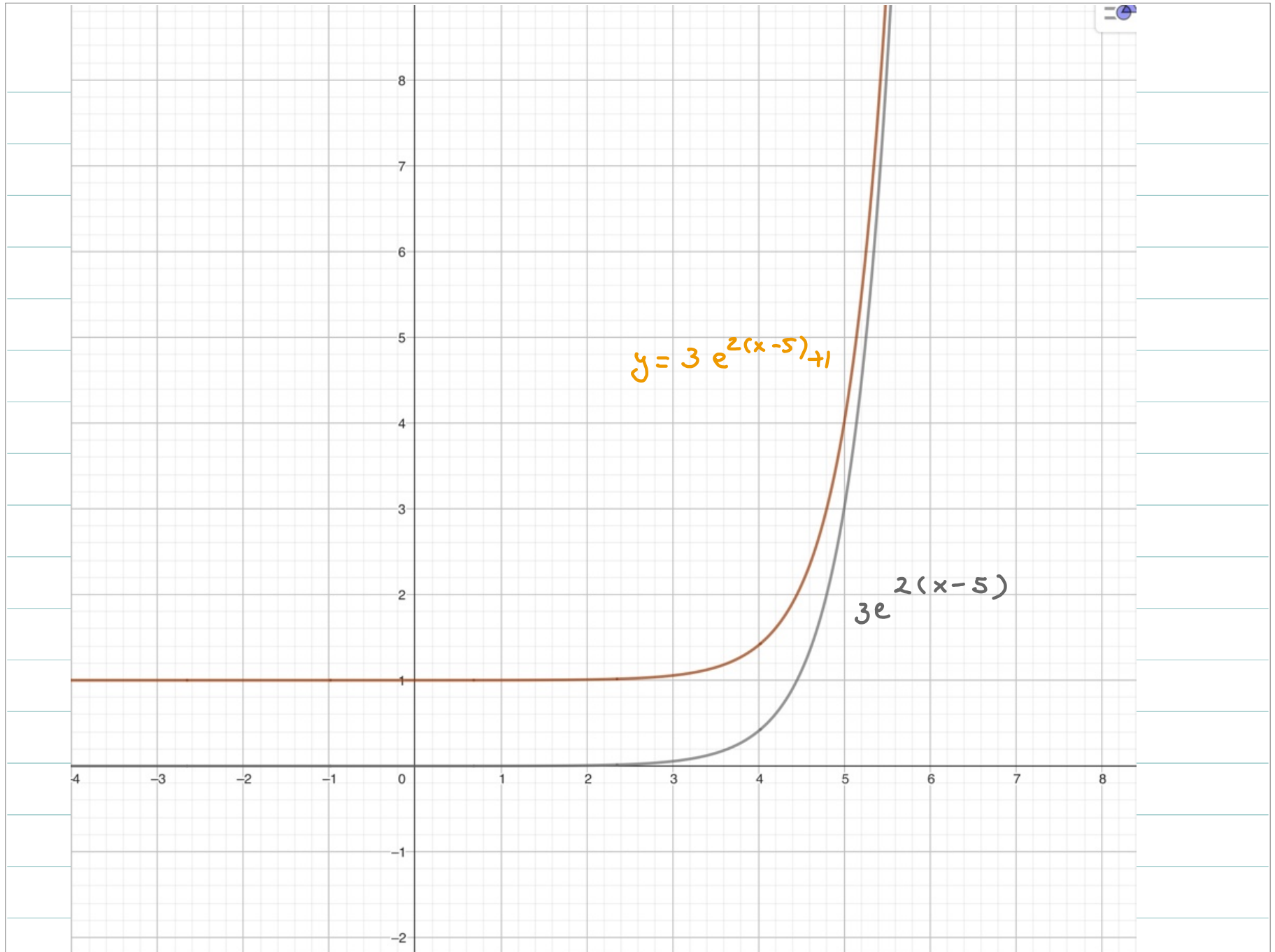
Note: the order is important.

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









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

Suppose $f(x)$ has domain $1 \leq x \leq 5$ and range $2 \leq y \leq 9$. What is the domain and range of $g(x) = 3f(6x - 1) + 8$?

An angle is the part of the plane in between two half lines starting at the same points. Angles are measured in degrees or radians. Certain precalculus/calculus formulas assume angles are measured in radians, so we often use radians as units.

$$360 \text{ deg} = 2\pi \text{ rad}$$

$$180 \text{ deg} = \pi \text{ rad}$$

$$90 \text{ deg} = \frac{\pi}{2} \text{ rad}$$

$$60 \text{ deg} = \frac{\pi}{3} \text{ rad}$$

$$45 \text{ deg} = \frac{\pi}{4} \text{ rad}$$

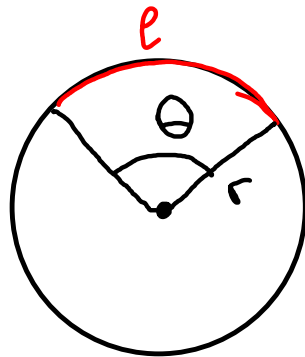
$$30 \text{ deg} = \frac{\pi}{6} \text{ rad}$$

$$1 \text{ deg} = \frac{360}{2\pi} \text{ rad}$$

$$1 \text{ rad} = \frac{2\pi}{360} \text{ deg}$$

If we measure angles in degrees , then $\frac{1}{60}$ of a degree is a minute and $\frac{1}{60}$ of a minute is a second. Convert 0.3 rad into deg, min, second.

Arc length

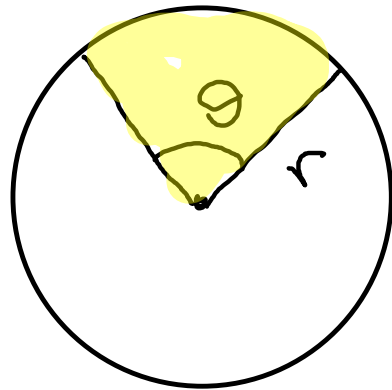


$$l = r\theta$$

θ measured in radians

1 rad = angle that corresponds to an arc of the unit circle with length 1

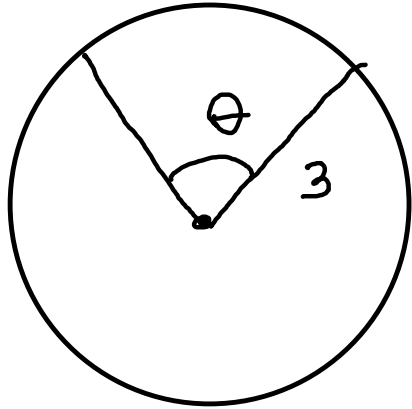
Area of wedge



$$A = \frac{1}{2}r^2\theta$$

θ measured in radians

Given that θ is $\frac{\pi}{6}$ ^{rad} and the circle has radius $r = 3$, what is the perimeter of the sector ?



A pizza of radius 8 in is divided into 8 equal slices. Tom eats A and Bob eats B. Who eats more ?

