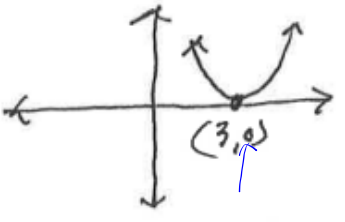
Pick Up the Warm Up

Questions on Homework

The quiz on sequences (and exponential functioins) will be toward the end of this period.

(13) Why does $y=(x-3)(x-3)$ only touch the x-axis at $x=3$ and no where else?

because 3 is the only value that will make $y=0$



(2) Where will $y = (x-8)(x-8)$ touch the x-axis? $(8,0)$

Where will $y = (x-20)^2$ touch the x-axis? $(20,0)$

Where will $y = (x+6)^2$ touch the x-axis? $(-6,0)$

Where will $y = (x-3)(x-1)$ touch the x-axis? $(3,0)$ $(1,0)$

(3) Transform the parapola $y = 7x^2$ so it slides (translates) 5 units to the right.

$y = 7(x-5)^2$ $7(x-5)^2$

what about 9 units left $y = 7(x+9)^2$ ✗

(4) In general, to slide any parabola to the right you replace (x) with $x - \text{something}$.

↑ input

⑤ Transform $y = x^2 + 5x + 4$ 8 units to the right.

$y = (x-8)^2 + 5(x-8) + 4$

$= (x-7)(x-4)$

(Graph both on your GDC to check)

$y = (x+1)(x+4)$

Questions on HW

18 (a)

$(4)^z = 8$

$(2^2)^z = (2)^3$

$2^{2z} = 2^3$

Left exponent = right exponent

$2z = 3$

$z = \frac{3}{2}$

(b)

$(4^2)^{\frac{z}{3}} = 8^{(z+2)}$

$(16)^{\frac{z}{3}} = 8^{(z+2)}$

$(2^4)^{\frac{z}{3}} = (2^3)^{z+2}$

$2^{\frac{4z}{3}} = 2^{3(z+2)}$

$\frac{4z}{3} = 3(z+2)$

$4z = 9(z+2)$

$4z = 9z + 18$

2-17 $p(x) = x^2 + 5x - 6$

(a) y-intercept $x = 0$ $(0, -6)$

(b) x-intercept $\rightarrow$ $y = 0$

$0 = x^2 + 5x - 6$

$a = 1$
$b = 5$
$c = -6$

Quadratic Formula

Factor, then use the zero product property

$$x = \frac{-(5) \pm \sqrt{(5)^2 - 4(1)(-6)}}{2(1)}$$

$$= \frac{-5 \pm \sqrt{49}}{2} = \frac{-5 \pm 7}{2}$$

$$x = \frac{-5+7}{2} \quad \frac{2}{2} = 1$$

$$x = \frac{-5-7}{2} = \frac{-12}{2} = -6$$

x-int

$(1, 0)$

$(-6, 0)$

(c) $q(x) = x^2 + 5x$ → y-intercept

$(0, 0)$

x-intercept ($y = 0$)

$0 = x^2 + 5x$

$0 = x(x + 5)$

$x = 0$ or $x + 5 = 0$

$x = -5$

$(0, 0)$

$(-5, 0)$

(d) $p(x) - q(x)$

$x^2 + 5x - 6 - [x^2 + 5x]$

$= x^2 + 5x - 6 - x^2 - 5x$

-6

$= -6$

19 a

a) $\left(\frac{1}{81}\right)^{-\frac{1}{4}} = \left(\frac{81}{1}\right)^{\frac{1}{4}} = \sqrt[4]{\quad}$

b) $x^{-2}y^{-4} =$

c) $(2x)^{-2}(16x^2y)^{\frac{1}{2}}$

b) $x^{-2} \cdot y^{-4}$

$= \frac{1}{x^2} \cdot \frac{1}{y^4}$

$\frac{1}{x^2y^4}$

19 ©

$(2x)^{-2}(16x^2y)^{\frac{1}{2}}$

20

First Week (each buy a popcorn + 1 drink)

$3p + 3d = 22.50$

2nd wk (each by $8 ticket + 1 popcorn + 3 drinks

$3d + p + 3(8) = 37.50$

$-3p + 8d = 22.50$

$p + -3d = 13.50$ $\times -3$

$3p + 3d = 22.50$

$-3p - 9d = -41.50$

$-6d = -18$

$d = 3$

$2p =$

21c $(0,5)$ $(5,0)$

$$d = \sqrt{(0-5)^2 + (5-0)^2}$$

$$\sqrt{(-5)^2 + 5^2}$$

$$\sqrt{50} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$$

(a) $3p + 3d = 22.50$

$p + 3d + 3(8) = 37.5$

(b)

(b) $4^{\frac{2z}{3}} = 8^{z+2}$

$(2^2)^{\frac{2z}{3}} \quad (2^3)^{z+2}$

$2^{\frac{4z}{3}} = 2^{3(z+2)}$

$\therefore$

(b) $4^{\frac{2z}{3}} = 8^{z+2}$

exponent on left = exponent on right

$\frac{4z}{3} = 3(z+2)$

$3\left(\frac{4z}{3}\right) = 9(z+2)$

$4z = 9z + 18$

$-9z \quad -9z$

$-5z = 18$

$z = -\frac{18}{5}$

NOTES

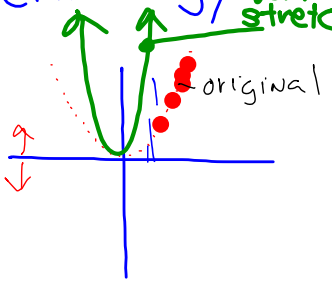
Determine Other Ways to Transform Parabolas

- (NOTES)

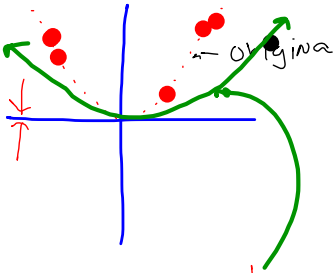
Today's AIM

Terminology

vertically stretched

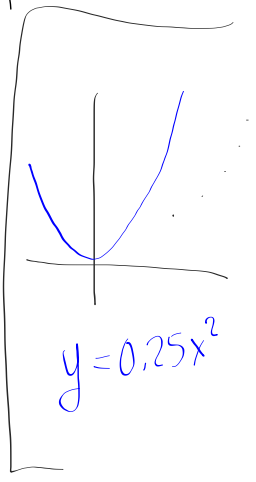


Vertical stretch

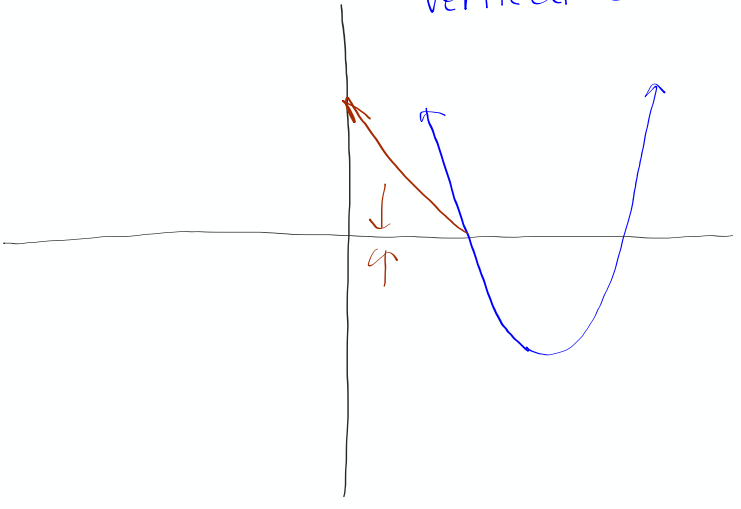


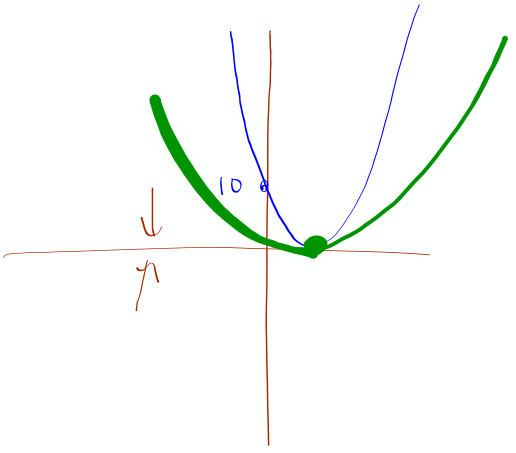
Vertical shrink

NOTES



Vertical Shrink

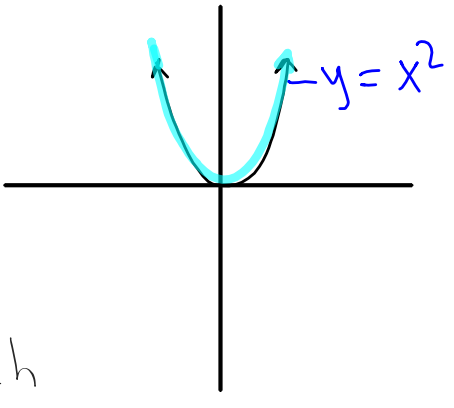


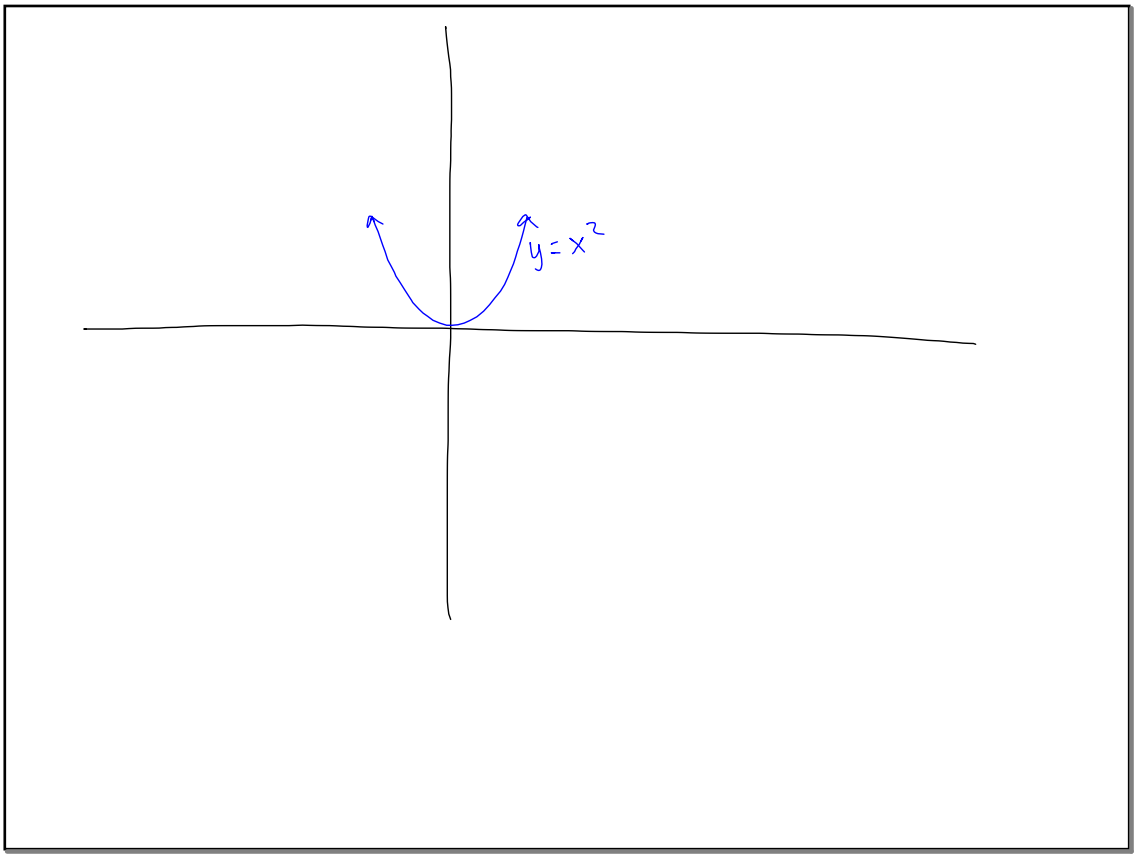


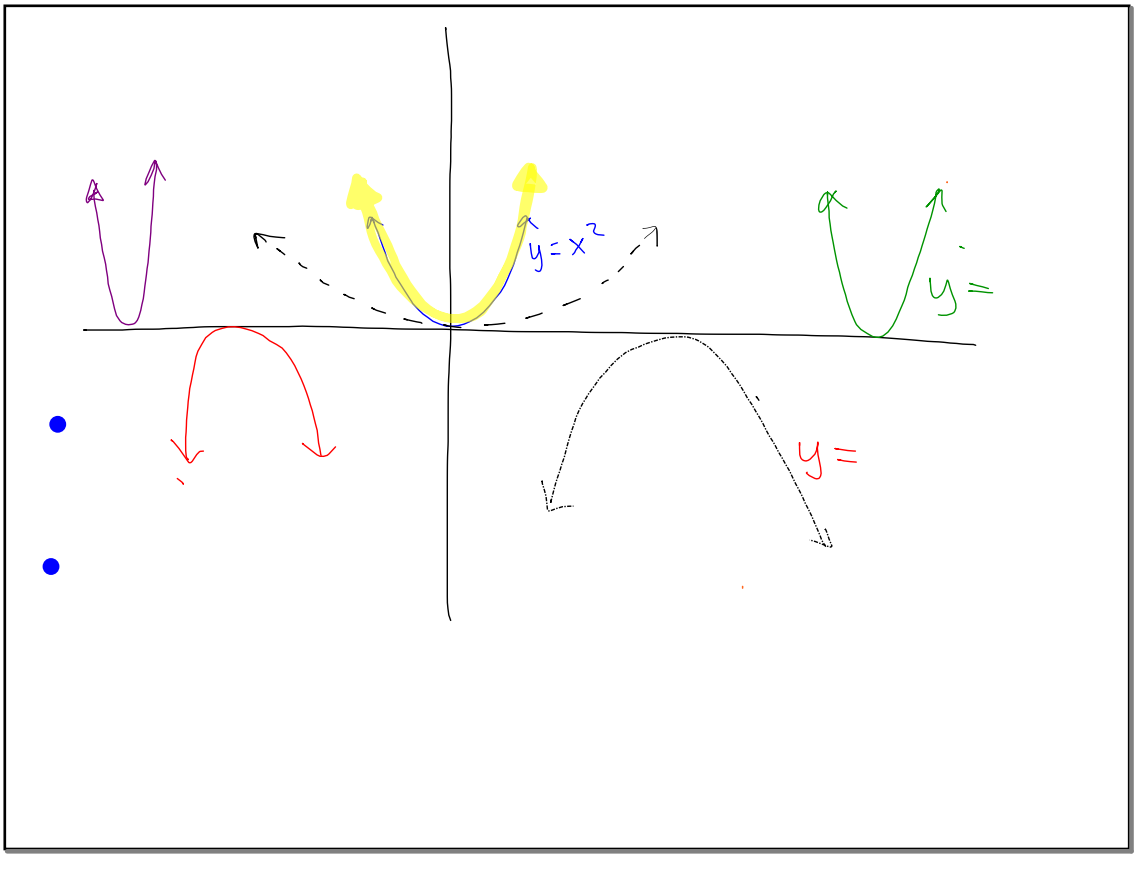
You'll Start with an investigation that will require you to record Transformations

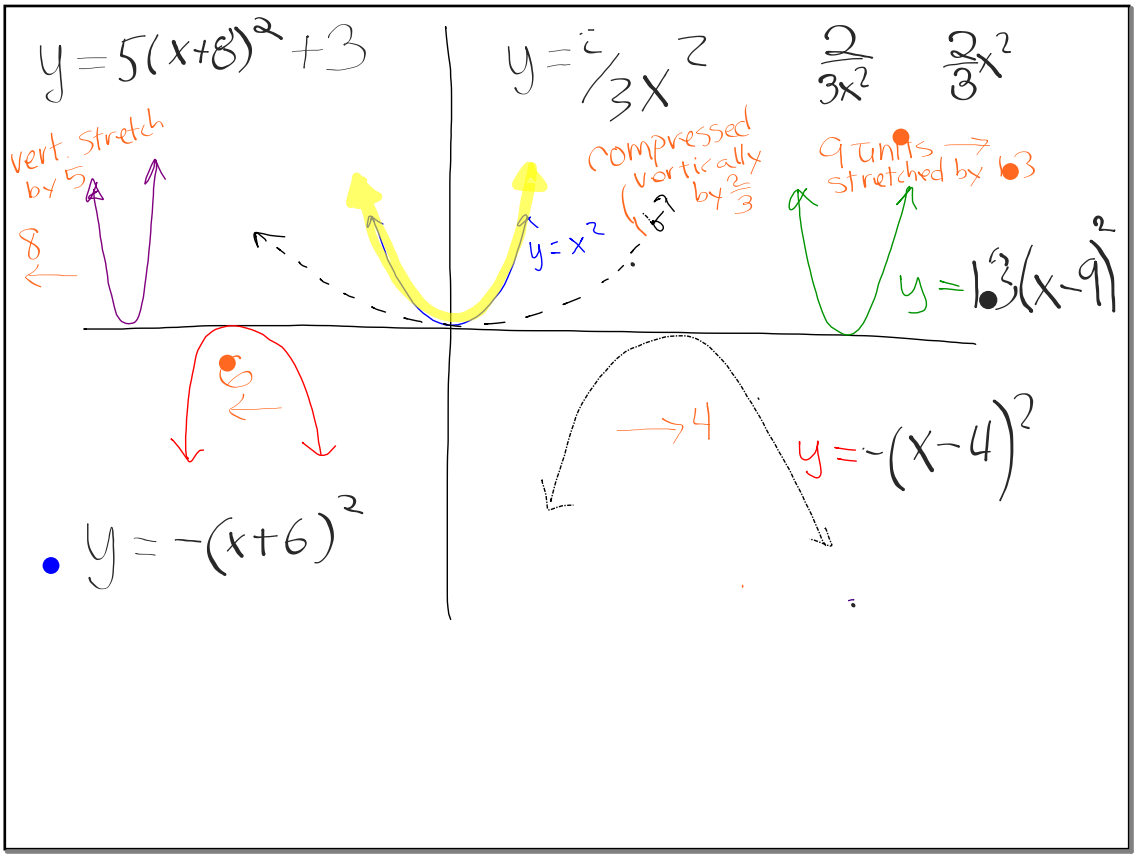
You'll make several transformations of the parent function $y = x^2$

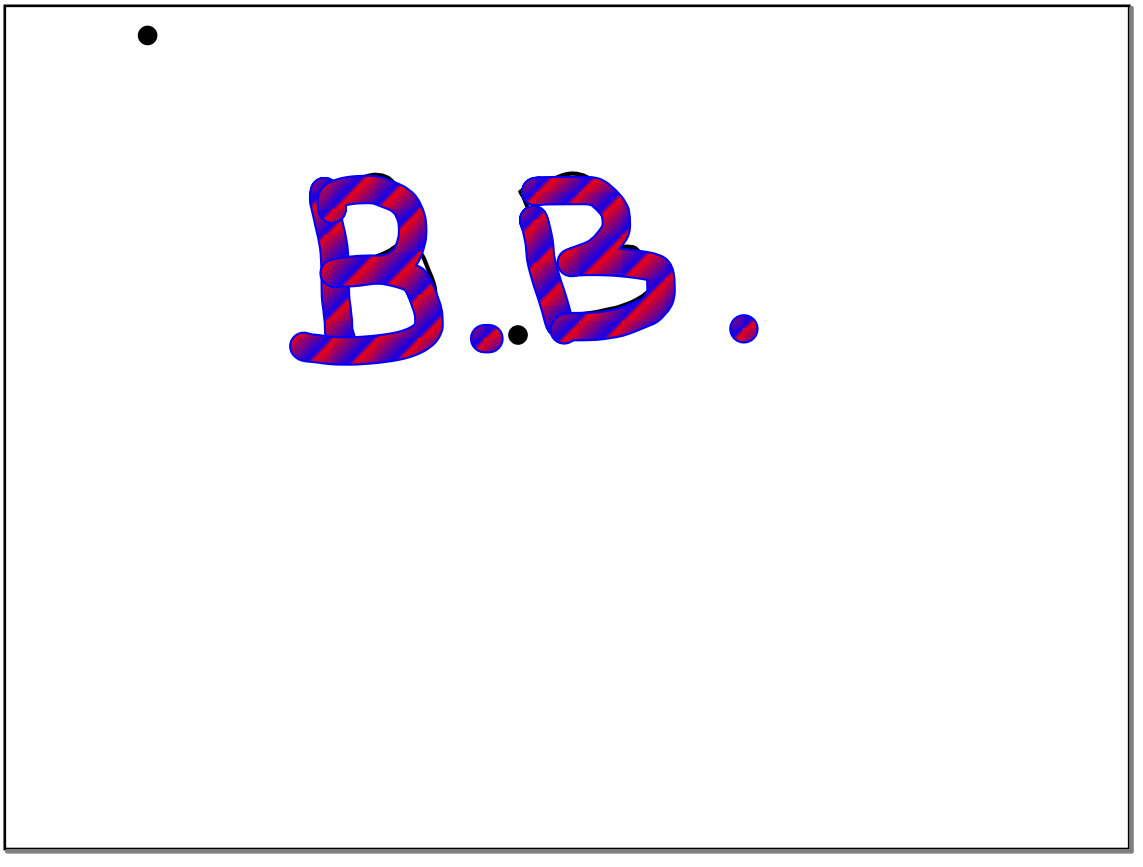
all on the same Large sketch




$y = x^2$

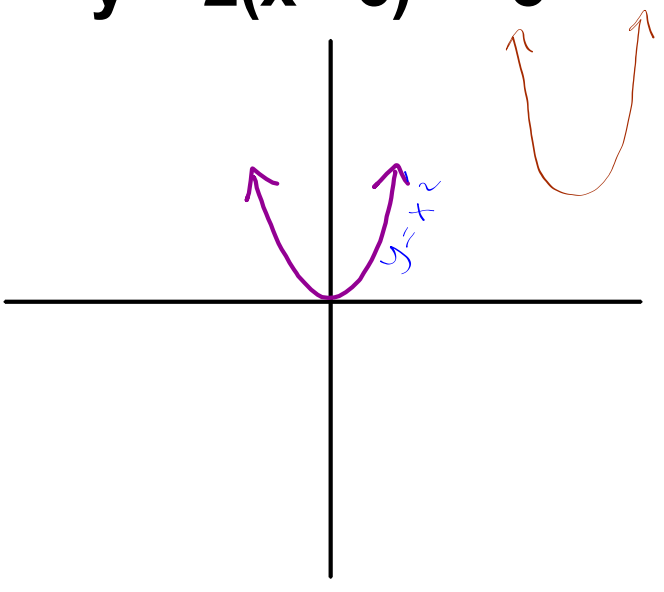

$y = x^2$
$y =$
$y =$


$y = 5(x+8)^2 + 3$
vert. stretch by 5
8
$y = -(x+6)^2$
$y = \frac{2}{3}x^2$
$\frac{2}{3x^2}$
$\frac{3}{2}x^2$
compressed vertically by $\frac{2}{3}$
$y = x^2$
9 units → stretched by 3
$y = 3(x-9)^2$
4
$y = -(x-4)^2$


B.B.

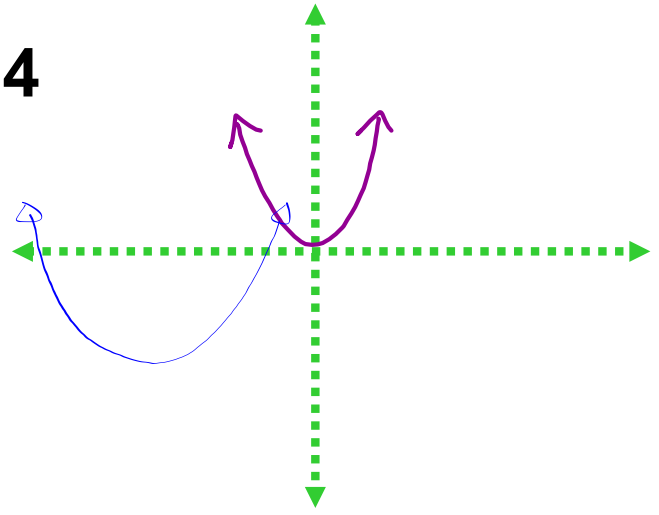
Closure

$$y = 2(x - 6)^2 + 3$$



Without Using a GDC, sketch the following....

$$y = \frac{1}{2}(x + 3)^2 - 4$$



Quiz
on Sequences
& Expon. Functions

Assignment

2 - 23 to 27, 28a, 29