

Agenda

Review Quiz 7

Lecture Circular Functions

Project

Review Quiz 7

Solve for x .

$$y_1: 3^{2x} - 10(3^x) + 9 = 0 \rightarrow (\cancel{3^x})^2 - 10(\cancel{3^x}) + 9 = 0$$

$u = 3^x$

Round to the nearest hundredth if necessary.

If there is more than one solution, separate them with commas.

$$(3^x)^2 = 3^{2x}$$

$$2, 0$$

$$u^2 - 10u + 9 = 0$$

$$(u - 9)(u - 1) = 0$$

$$u = 9 \quad u = 1$$

$$\boxed{3^x = 9}$$

$$\boxed{3^x = 1}$$

$$3^2 = 9$$

$$3^0 = 1$$

Review Quiz 7

Solve for x .

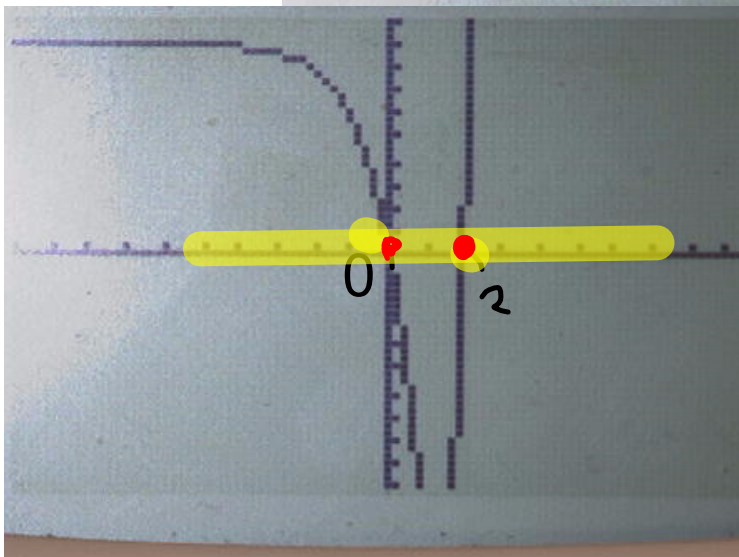
$$3^{2x} - 10(3^x) + 9 = 0$$

Round to the nearest hundredth if necessary.

If there is more than one solution, separate them with commas.

```
3^(2X)-10(3^X)=0
X=2 init guess: 36
bound=(-1E99, 1E99)
left-rt=0
```

```
3^(2X)-10(3^X)=0
X=.0590519342
bound=(-1E99, 1E99)
left-rt=0
```



$$y = \dots = 0$$

$$3^{2x} - 10(3^x) + 9 = 0$$

$$u = 3^x$$

$$u^2 = 3^{2x}$$

$$u^2 - 10u + 9 = 0$$

$$(u - 9)(u - 1)$$

$$u = 9, 1$$

$$3^x = 9 \quad 3^x = 1$$

$$x = \log_3 9$$

$$= \frac{\ln 9}{\ln 3}$$

$$= 2$$

$$= 0$$

Prop 1 Definition • Solve for exponent
• Get rid of log
 $y = B^x$ $x = \log_B y$

Prop 2 Sum/Product

$\log_B x + \log_B y = \log_B (xy)$
 "Ladder" \log_B

Prop 3

Prop 4

Change of Base

Prop 5

Log of Both Sides

~~$\log_B x$~~ \log_B \log_A B

$$\log_B A = \frac{\log_A A}{\log_A B}$$

Solving an equation involving logarithms on both sides: Problem type 1

Solve for x .

$$-\log_4(x+3) = 1 - \log_4(x+6)$$

$$\begin{aligned} -\log_4 1 &= 1 - \log_4 4 \\ 0 &= 1 - 1 \end{aligned}$$

If there is more than one solution, separate them with commas. If there is no solution, click on "No solution".

$$\log_4(x+6) - \log_4(x+3) = 1$$

~~P3~~ (Expansion)

$$\log_4(x+6) + \log_4(x+3)^{-1} = 1$$

$$\log_4[(x+6)(x+3)^{-1}] = 1$$

(P1)

$$4^1 = \frac{x+6}{x+3}$$

$$4x + 12 = x + 6$$

$$3x = -6$$

$$x = -2$$

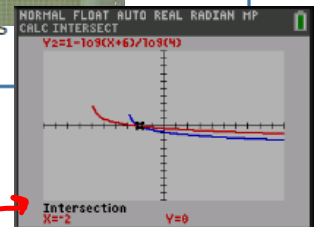
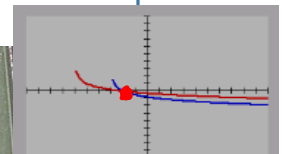
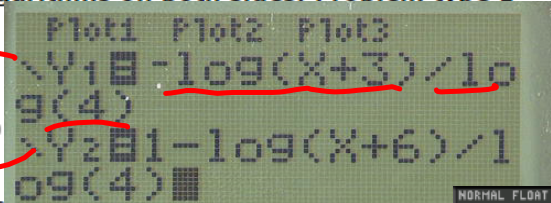
Algebra.

Solving an equation involving logarithms on both sides: Problem type 1

Solve for x .

$$-\log_4(x+3) = 1 - \log_4(x+6)$$

If there is more than one solution, separate them with commas. If there is no solution, write "No solution".



We can work as follows.

$$-\log_4(x+3) = 1 - \log_4(x+6)$$

$$\log_4(x+6) - \log_4(x+3) = 1$$

$$\log_4\left(\frac{x+6}{x+3}\right) = 1$$

$$\frac{x+6}{x+3} = 4^1$$

$$\frac{x+6}{x+3} = 4$$

$$x+6 = 4(x+3)$$

$$x+6 = 4x+12$$

$$-3x = 6$$

$$x = -2$$

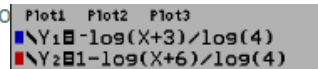
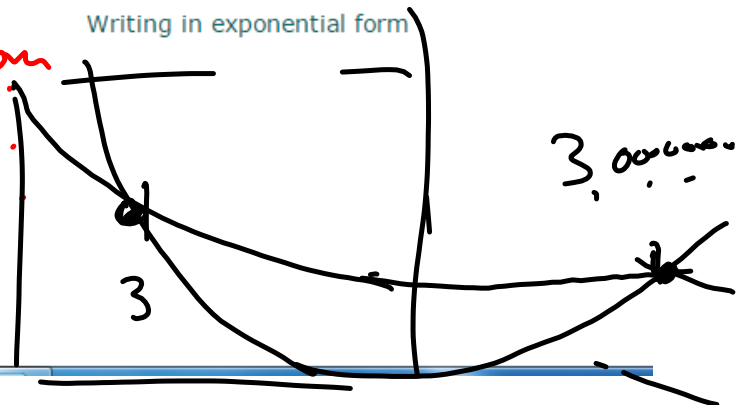
Arith.
P2
P1

Moving the log terms to

Using the rule for logarithm of a quotient

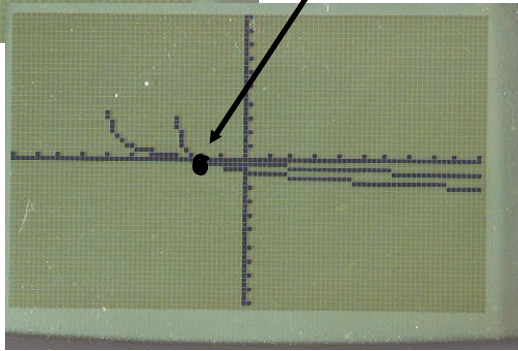
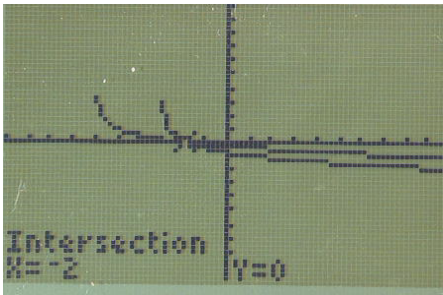
Writing in exponential form

Algebra



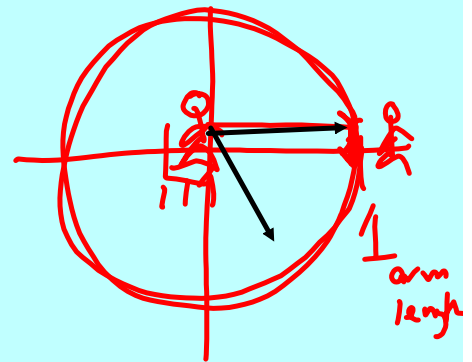
```
Plot1 Plot2 Plot3
√Y1 = -log(X+3)/10
9(4)
√Y2 = 1 - log(X+6)/1
09(4)
```

calc 5: in
enter ...



Lecture Circular Functions

- Converting a decimal degree to degrees-minutes-seconds
- Converting between degree and radian measure: Problem type 2
- Coterminal angles [?](#)
- Arc length and central angle measure [?](#)
- Finding trigonometric ratios from a point on the unit circle
- Trigonometric functions and special angles: Problem type 3
- Evaluating expressions involving sine and cosine
- Even and odd properties of trigonometric functions [?](#)
- Using a calculator to approximate cosecant, secant, and cotangent values [?](#)
- Evaluating a sinusoidal function that models a real-world situation [?](#)
- Sine, cosine, and tangent ratios: Numbers for side lengths
- Sine, cosine, and tangent ratios: Variables for side lengths [?](#)
- Using the Pythagorean Theorem to find a trigonometric ratio
- Finding trigonometric ratios given a right triangle [?](#)
- Using a trigonometric ratio to find a side length in a right triangle [?](#)
- Using trigonometry to find a length in a word problem with one right triangle [?](#)

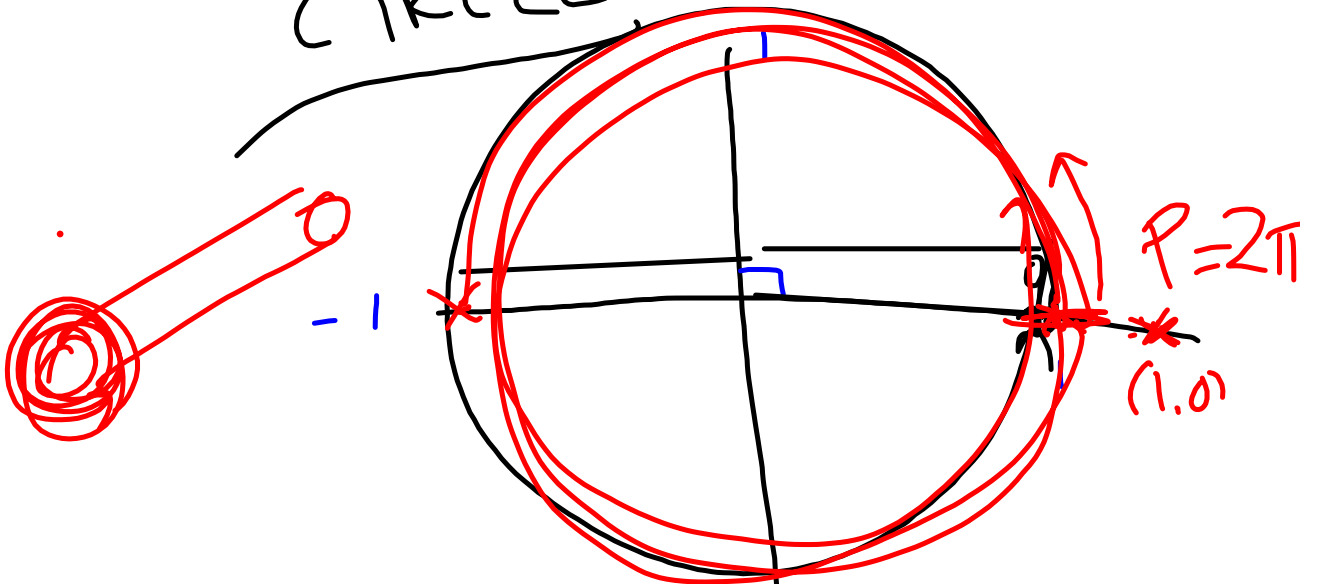


6.28 strides

Unit circle $r = 1$
 Circum. $2\pi(1) = 2\pi$ strides

UNIT (1)
CIRCLE

radius = 1



Wrapping Function.

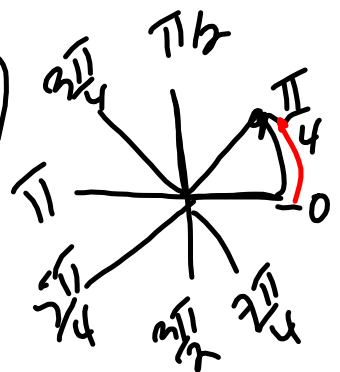
input. $W(0) = (1, 0)$ *cut put*

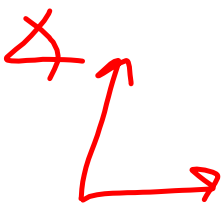
$W(\frac{\pi}{2}) = (0, 1)$

$W(\pi) = (-1, 0)$

$W(2\pi) = (1, 0)$

$W(\frac{\pi}{4}) = (\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$



Degrees (Angles) Δ 

$W(0^\circ) = (1, 0)$

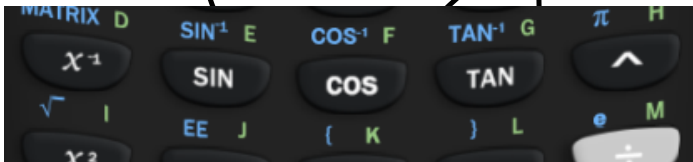
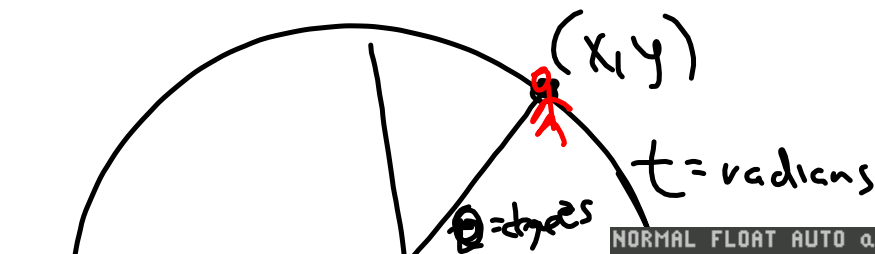
$W(45^\circ) = (.707\dots, .707\dots)$

$W(90^\circ) = (0, 1)$

$W(90,000^\circ) = ?$

$$(\underline{x}, \underline{y}) = (\underline{\cos t}, \underline{\sin t})$$

"cosine" "sine"



```
NORMAL FLOAT AUTO a+bi RADIAN CL
sin(45)
.....
.8509035245
sin(45°)
.....
.7071067812
```

```
NORMAL FLOAT AUTO a+bi RADIAN CL
MATHPRINT CLASSIC
SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNCTION PARAMETRIC POLAR SEQ
THICK DOT-THICK THIN DOT-THIN
SEQUENTIAL SIMUL
REAL a+bi re^(θi)
FULL HORIZONTAL GRAPH-TABLE
FRACTIONTYPE: n/d Un/d
ANSWERS: AUTO DEC FRAC-APPROX
GO TO 2ND FORMAT GRAPH: NO YES
STAT DIAGNOSTICS: OFF ON
STAT WIZARDS: ON OFF
SET CLOCK 03/27/20 3:10AM
```

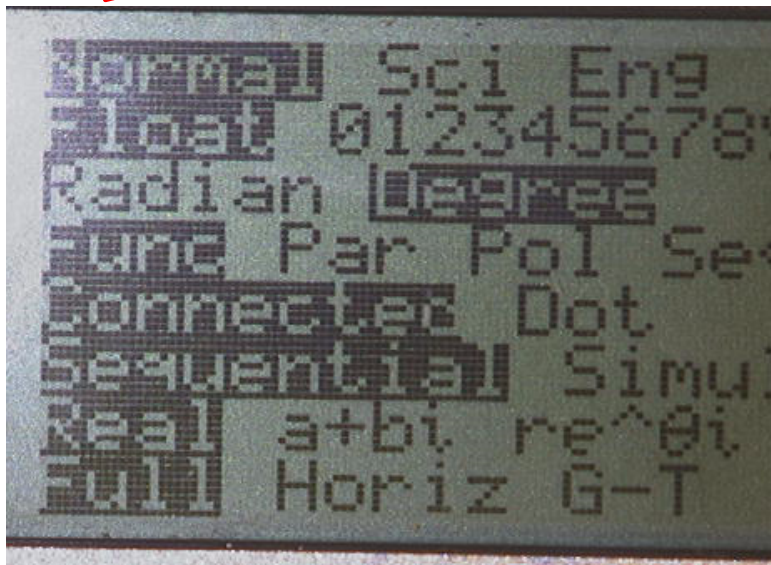
$$x = \cos t$$

$$y = \cos x \quad (x \text{ input})$$

$$y = \sin t$$

$$y = \sin x$$

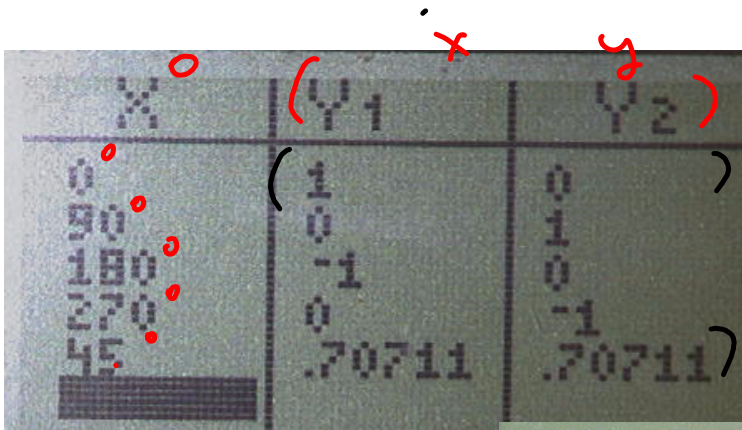
mode



$$y_1 = \cos X \quad (x \text{ coord})$$

$$y_2 = \sin X \quad (y \text{ coord})$$

" θ " = theta



$$w(0^\circ) = (1, 0)$$

$$w(90^\circ) = (0, 1)$$

$$w(45^\circ) =$$

$$(.7071, .7071)$$

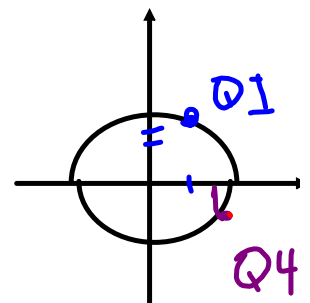
1: θ
 2: r
 3: r
 4: \rightarrow DMS
 5: $R \rightarrow P r$
 6: $R \rightarrow P \theta$
 7: $\downarrow P \rightarrow R x$

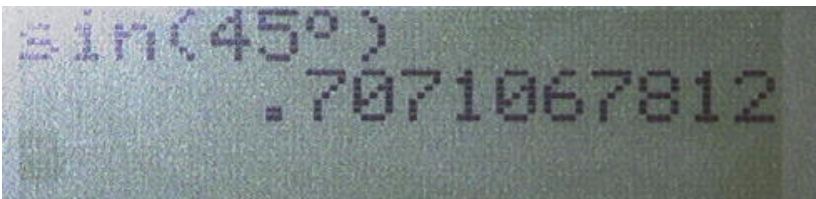
```

MODE          Sci Eng
MODE          0123456789
MODE          Degree
MODE          Par Pol Seq
MODE          Dot
MODE          Simul
MODE          a+bi re^θi
MODE          Horiz G-T

```

X	Y1	Y2
0	1	0
90	.4481	.894
180	-.5985	-.8012
270	-.98538	-.176
45	.52532	.8509
90000	.94062	.3395





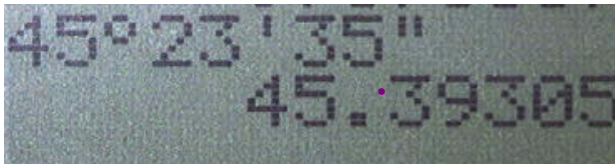
sin(45°)
.7071067812

Degrees
60 Minutes : in Degree
60 Seconds in Min
3600 seconds in Degree

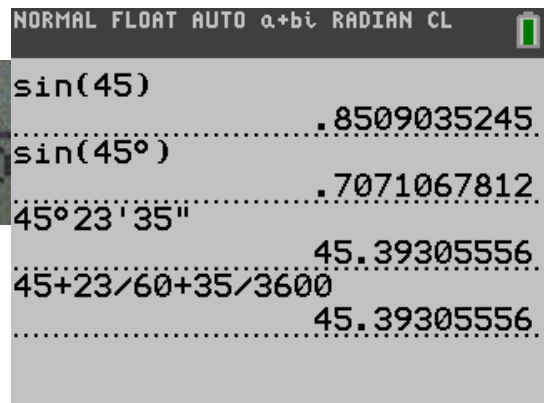
$$45^\circ 23' 35'' \quad 45 + 23/60 + 35/3600$$

$$45 + .3833 \quad + \quad .009722$$

$$45.389722$$



45° 23' 35"
45.39305



NORMAL FLOAT AUTO a+bi RADIAN CL

sin(45)	.8509035245
sin(45°)	.7071067812
45° 23' 35"	45.39305556
45+23/60+35/3600	45.39305556

change 23.3455 degrees to DMS?

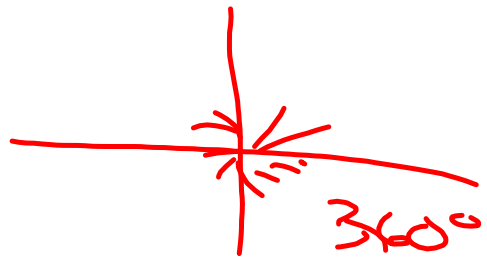
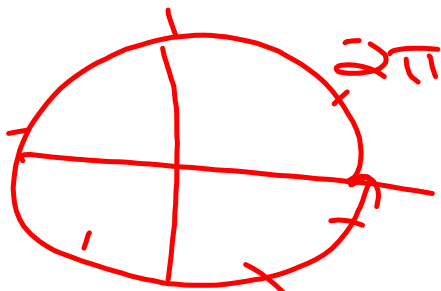
23 degrees

$.3455 * 60 = 20.73$ 20 minutes

$.73 * 60 = 43.8$ 44 seconds

23° 20' 44"





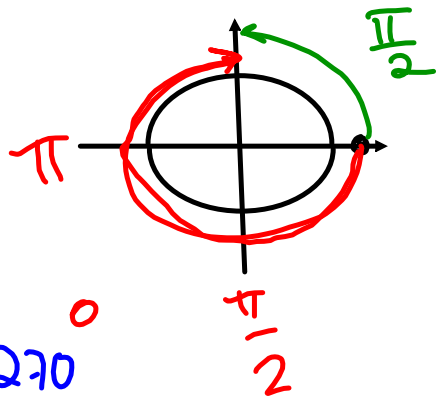
$$360 \quad \frac{\pi}{180} = \frac{36\pi}{180} \quad 360^\circ = 2\pi$$

$$= \frac{2\pi}{5} = \frac{\pi}{5} \quad 180^\circ = \pi$$

$$\left(\frac{\pi}{6}\right) \left(\frac{180^\circ}{\pi}\right) = 30^\circ \quad \frac{180^\circ}{\pi} = \frac{\pi}{180}$$

$$\frac{\pi}{6} = 30^\circ \quad \frac{180^\circ}{\pi} = \frac{\pi}{180} = 1$$

Convert $-\frac{3\pi}{2}$ radians to degree measure.

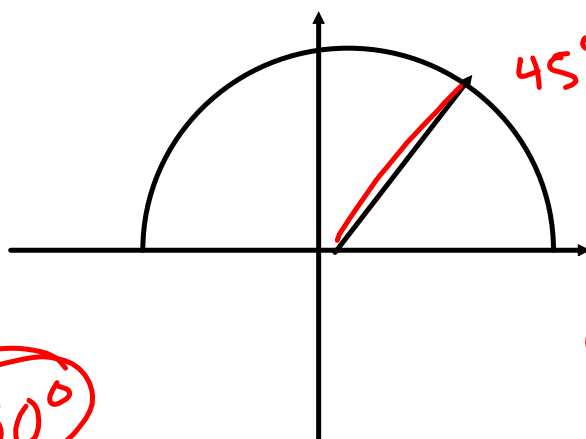


$$-\frac{3}{2}\pi \cdot \left(\frac{180^\circ}{\pi}\right) = -270^\circ$$

$$3 \cdot \frac{12''}{1'} = 36'' \quad \pi = 180^\circ$$

(coterminal)

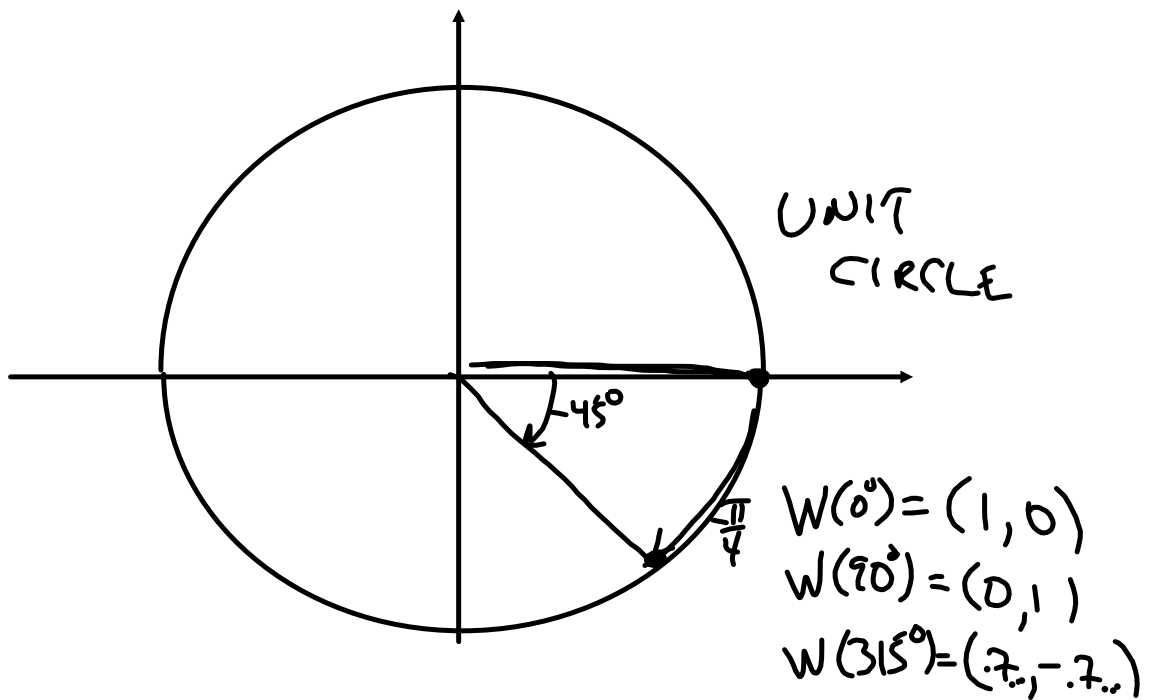
Coterminal



45° and
 $45^\circ + 360^\circ$
 405°
are

Coterminal

$$\begin{array}{r} \textcircled{780^\circ} \\ - 360 \\ \hline - 360 \\ \hline 0 < \textcircled{60} < 360 \end{array}$$



X-value · Cosine

$$\cos(0^\circ) = 1$$

$$\cos(90^\circ) = 0$$

$$\cos(315^\circ) = \frac{\sqrt{2}}{2}$$

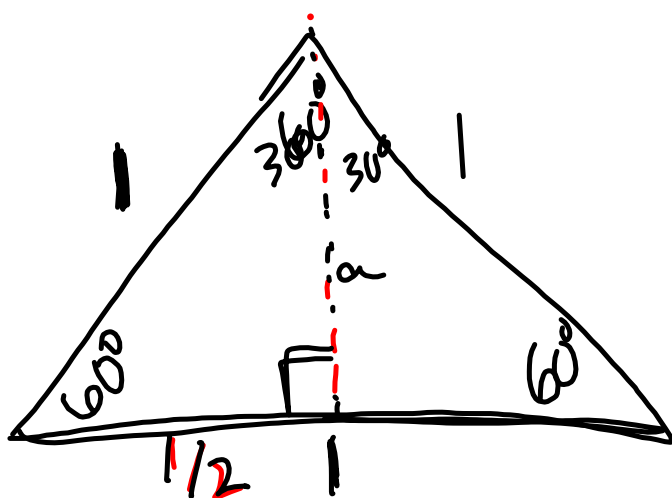
Y-value · Sine

$$\sin(0^\circ) = 0$$

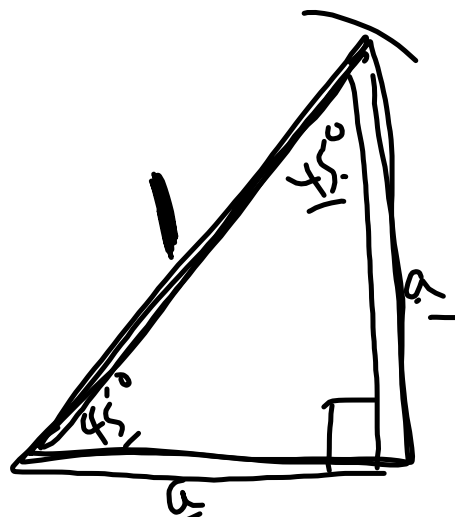
$$\sin(90^\circ) = 1$$

$$\sin(315^\circ) = -\frac{\sqrt{2}}{2}$$

Special Angles



$$\begin{aligned}
 a^2 + \left(\frac{1}{2}\right)^2 &= 1^2 \\
 a^2 + \frac{1}{4} &= 1 \\
 a^2 &= \frac{3}{4} \\
 a &= \sqrt{\frac{3}{4}} \\
 &= .866\dots
 \end{aligned}$$



$$\begin{aligned}
 a^2 + a^2 &= 1 \\
 2a^2 &= 1 \\
 a^2 &= \frac{1}{2} \\
 a &= \sqrt{\frac{1}{2}} \\
 &= \frac{1}{\sqrt{2}} \\
 &= \frac{\sqrt{2}}{2} \\
 &= .707\dots
 \end{aligned}$$

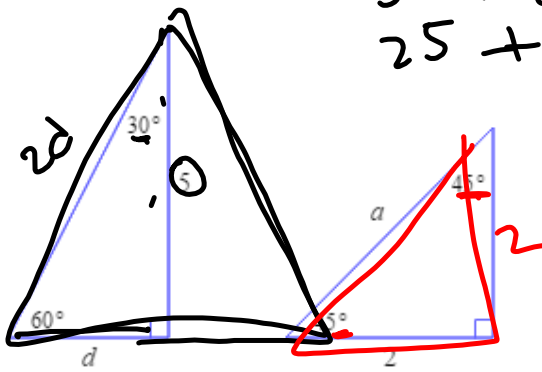
	0°	30°	45°	60°	90°
$\cos(\theta)$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$ 0.866	$\frac{\sqrt{2}}{2}$ 0.707	$\frac{\sqrt{1}}{2}$ 0.5	$\frac{\sqrt{0}}{2}$
$\sin(\theta)$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$ 0.5	$\frac{\sqrt{2}}{2}$ 0.707	$\frac{\sqrt{3}}{2}$ 0.866	$\frac{\sqrt{4}}{2}$



Special right triangles: Exact answers

For the right triangles below, find the exact values of the side lengths d and a .

If necessary, write your responses in simplified radical form.



$$5^2 + d^2 = (2d)^2$$
$$25 + d^2 = 4d^2$$

$$25 = 3d^2$$

$$\frac{25}{3} = d^2$$

$$d = \frac{5}{\sqrt{3}}$$

$$2^2 + 2^2 = a^2$$

$$8 = a^2 \quad a = \sqrt{8}$$

Special right triangles: Exact answers

For the right triangles below, find the exact values of the side lengths d and a .

If necessary, write your responses in simplified radical form.

$d^2 + 5^2 = 4d^2$
 $5^2 = 3d^2$
 $25 = 3d^2$
 $d^2 = \frac{25}{3}$
 $d = \frac{5}{\sqrt{3}}$

$a = 2\sqrt{2}$

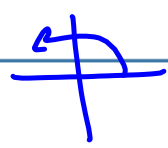
Convert degrees to radians

\$3 won = \$ 1 gambled

$$\text{\$20 gambled} \cdot \frac{\text{\$3 won}}{\text{\$1 gambled}} = \text{\$60 won}$$

$2\pi = 360$ degrees

$$45^\circ \cdot \left(\frac{\pi}{180^\circ} \right) = \frac{\pi}{4} \text{ rad}$$



Arc length and central angle measure

A circular arc has measure 10 in and is intercepted by a central angle of 60° . Find the radius r of the circle.

Do not round any intermediate computations, and round your answer to the nearest tenth.

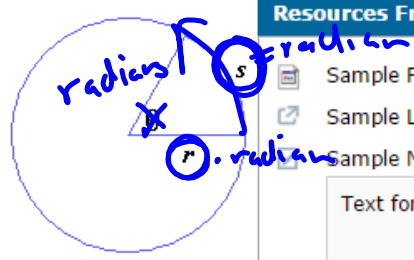
Suppose that a central angle of θ radians intercepts an arc of length s in a circle of radius r .

Your resources will appear in the box below.

Then the length s of the arc is given by the following.

$$s = r\theta$$

[Deriving this formula](#)



We can solve this equation for r .

$$r = \frac{s}{\theta}$$

In order to use this equation, we must first convert the given angle to radian measure.

$$\theta = 60^\circ = 60 \cdot \left(\frac{\pi}{180}\right) \text{ radians} = \frac{\pi}{3} \text{ radians}$$

Resources From Your Instructor

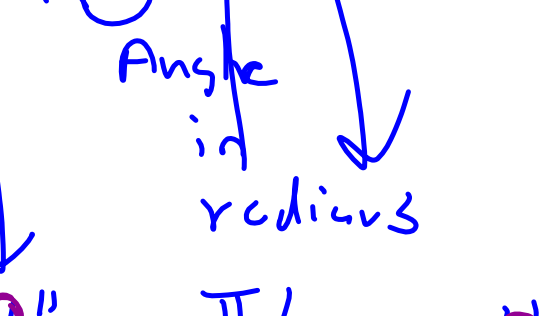
- Sample File
- Sample Link
- Sample Note

Text for students to read.

Additional Resources

Precalculus, 2nd Ed.
Coburn

$$S = r \cdot \theta$$



Angle in radians

$8'' \cdot \frac{\pi}{4} = 2\pi'' \approx 6$

$45^\circ \rightarrow \frac{\pi}{4}$

Arc length and central angle measure

A circular arc has measure 10 in and is intercepted by a central angle of 60° . Find the radius r of the circle.

Do not round any intermediate computations, and round

$$s = r\theta = 10(.866)$$

60degrees = .866
NORMAL FLOAT AUTO a+bj RADIAN CL
60 * pi / 180
1.047197551

Suppose that a central angle of θ radians intercepts an arc of length s in a circle of radius r .

Then the length s of the arc is given by the following.

$$s = r\theta$$

Deriving this formula

$$10 = r \cdot 1.047 \dots$$

We can solve this equation for r .

$$r = \frac{s}{\theta}$$

s = length of pizza bone

In order to use this equation, we must first convert the given angle to radian measure.

$$\theta = 60^\circ = 60 \cdot \left(\frac{\pi}{180}\right) \text{ radians} = \frac{\pi}{3} \text{ radians}$$

Text for students to read.

Additional Resources

Precalculus, 2nd Ed.
Coburn

90degrees = pi/2 radians

8 inch slice (radius)

pizza bone (2 slices) = 8" times pi/2 = 4pi"

Coterminal angles

Answer the following.

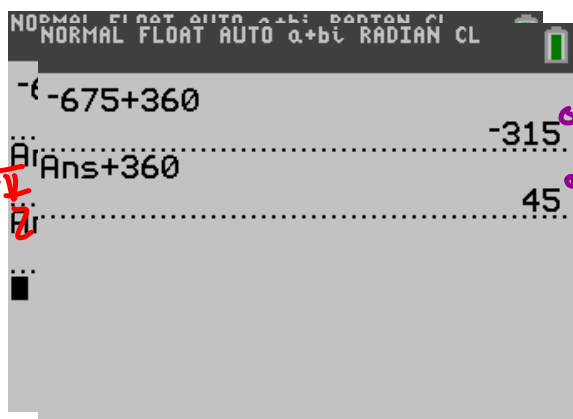
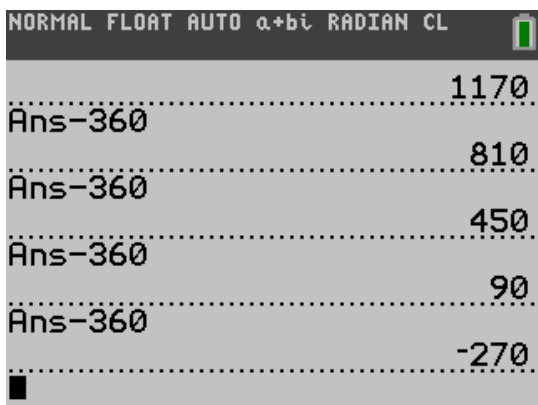
(a) Find an angle between 0 and 2π that is coterminal with $\frac{13\pi}{2}$. $= 1$

(b) Find an angle between 0° and 360° that is coterminal with -675° . $= 45^\circ$

Give exact values for your answers.

$$\frac{13\pi}{2} \cdot \frac{180}{\pi} = 1170 = 90^\circ$$

$$90^\circ \cdot \frac{\pi}{180} = \frac{\pi}{2}$$



Coterminal angles

Answer the following.

(a) Find an angle between 0 and 2π that is coterminal with $\frac{13\pi}{2}$.

(b) Find an angle between 0° and 360° that is coterminal with -675° .

Give exact values for your answers.

rad \rightarrow deg.

$\frac{13\pi}{2}$

\rightarrow

$\frac{180}{\pi}$

\rightarrow

1170

-675°

$\Leftrightarrow 45^\circ$

-360

810

$+360$

-315

$+360$

45°

90°

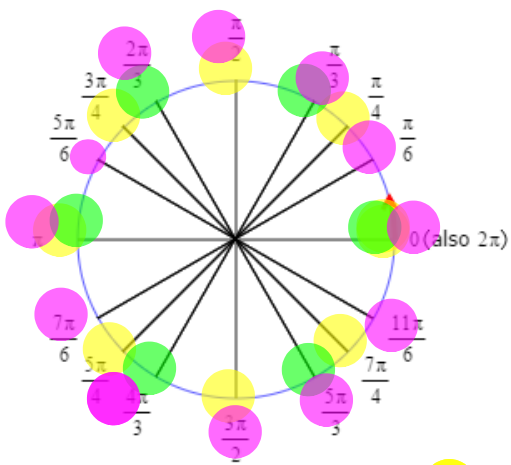
90°

$\frac{\pi}{2}$

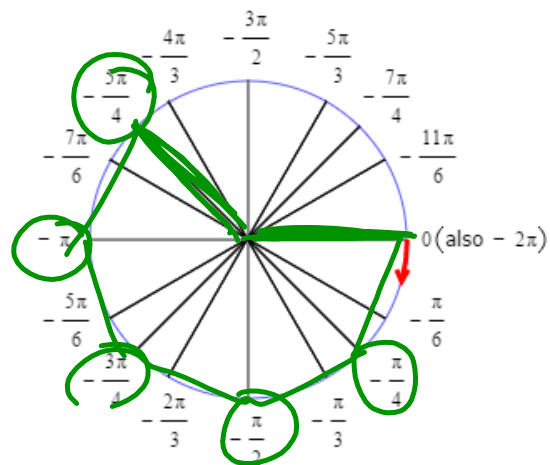
\leftarrow

$\frac{\pi}{180}$

Positive angles

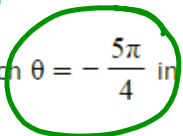


Negative angles



The current problem:

We must sketch $\theta = -\frac{5\pi}{4}$ in standard position.



● 8 slice pizza

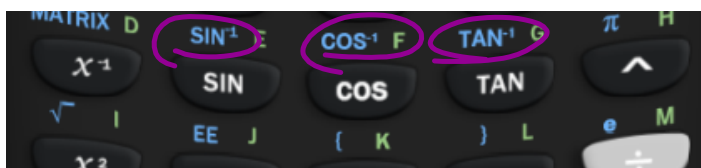
● 12 slice pizza

● 6 slice pizza

$\sin(t)$

$\cos(t)$

$\tan(t)$



inverse $f^{-1}(x)$ ← $\sin^{-1}(t)$ $2^{-1} = \frac{1}{2}$

$$\frac{1}{\sin(t)} \equiv \frac{\text{Csc}(t)}{\quad} \quad \text{Cosecant} \left(\frac{1}{y}\right)$$
$$\frac{1}{\cos(t)} \equiv \frac{\text{Sec}(t)}{\quad} \quad \text{Secant} \left(\frac{1}{x}\right)$$
$$\frac{1}{\tan(t)} \equiv \frac{\text{cot}(t)}{\quad} \quad \text{cotangent} \left(\frac{x}{y}\right)$$

Finding trigonometric ratios from a point on the unit circle

Suppose that θ is an angle in standard position whose terminal side intersects the unit circle at

$$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right)$$

Find the exact values of $\cot\theta$, $\cos\theta$, and $\csc\theta$.

$\sin\theta = \frac{y}{r} = \frac{\frac{\sqrt{2}}{2}}{1} = \frac{\sqrt{2}}{2}$ $\csc\theta = \frac{1}{\sin\theta} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$ cosecant

$\cos\theta = \frac{x}{r} = \frac{\frac{\sqrt{2}}{2}}{1} = \frac{\sqrt{2}}{2}$ $\sec\theta = \frac{1}{\cos\theta} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$ secant

$\tan\theta = \frac{y}{x} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$ $\cot\theta = \frac{x}{y} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$ cotangent

Team Cupcake

$$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right)$$
$$\cot\theta = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$
$$\cos\theta = \frac{\sqrt{2}}{2}$$
$$\csc\theta = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$$

$f^{-1}(x) \rightarrow$ inverse

$\sin^{-1}(x) \rightarrow$ inverse sine

$$\frac{1}{\sin(x)} = (\sin(x))^{-1} = \csc x$$
$$\frac{1}{\cos(x)} = \sec x$$

Examples

Trigonometric functions and special angles: Problem type 1

Find the exact value of $\sin\left(-\frac{4\pi}{3}\right)$.

Handwritten work on lined paper:

- Equation: $\sin\left(-\frac{4\pi}{3}\right)$
- Conversion: $\frac{4\pi}{3} \cdot \frac{180}{\pi} = 240^\circ$
- Unit circle diagram showing the angle 240° (or $4\pi/3$) in the third quadrant. The y-coordinate is labeled $-\frac{\sqrt{3}}{2}$.
- TI-84 Plus CE calculator screen showing:
 - Mode: NORMAL FLOAT AUTO REAL RADIAN MP
 - Input: $\sin(-4\pi/3)$
 - Output: $.8660254038$
 - Input: $\sqrt{3}/2$
 - Output: $.8660254038$
- Handwritten green notes: $\frac{\sqrt{3}}{2}$ (circled) and $2\sqrt{3}$ with an arrow pointing to the calculator screen.

$$\left. \begin{aligned} .707 &= \frac{\sqrt{2}}{2} \\ .866 &= \frac{\sqrt{3}}{2} \\ 1.73 &= \sqrt{3} \\ .57 &= \frac{\sqrt{3}}{3} \\ 1.414 &= \sqrt{2} \end{aligned} \right\}$$

Trigonometric functions and special angles: Problem type 2

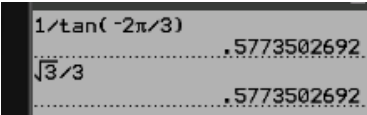
Find the exact values below. If applicable, click on "Undefined".

$\tan 0$

$\csc 0$



Trigonometric functions and special angles: Problem type 2



Find the exact values below. If applicable, click on "Undefined".

$$\cot\left(-\frac{2\pi}{3}\right) = \sqrt{3}$$

$$\sec\left(-\frac{2\pi}{3}\right) = -2$$

$$1/\tan(-2\pi/3) =$$

$$1/\cos(-2\pi/3) = -2$$

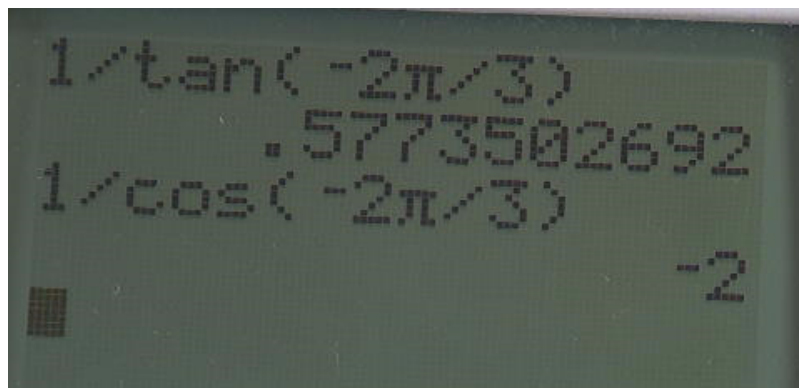
	0°	30°	45°	60°	90°
cos(θ)	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
sin(θ)	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1

$$1/\cos$$

$$\frac{2\sqrt{3}}{3} = 1.155 \quad \frac{\sqrt{2}}{1} = 1.414$$

$$\sin/\cos$$

$$\frac{\sqrt{3}}{1} = 1.732 \quad \frac{\sqrt{3}}{3} = .577$$

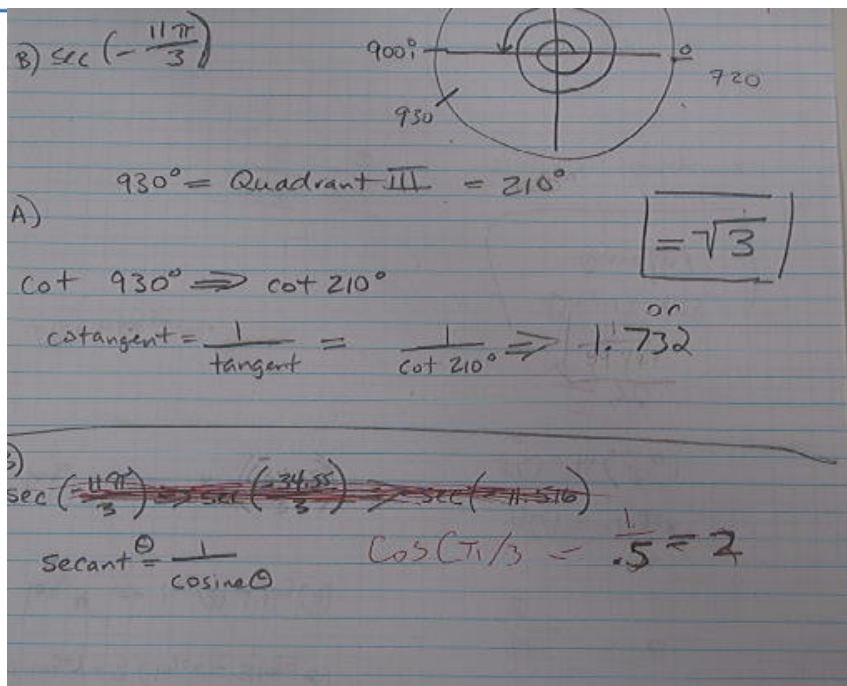


Trigonometric functions and special angles: Problem type 3

Find the exact values below. If applicable, click on "Undefined."

$$\cot 930^\circ$$

$$\sec\left(-\frac{11\pi}{3}\right)$$



Area of a sector of a circle

The area of a sector of a circle with a central angle of $\frac{7\pi}{6}$ radians is 23cm^2 . Find the radius of the circle.

Do not round any intermediate computations. Round your answer to the nearest tenth.

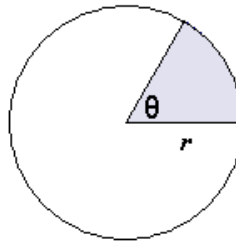
The area A of a sector of a circle with radius r and central angle θ is as follows.

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

Deriving
the formula

Note that for this formula, θ must be in radians.

For our problem, the area is $A = 23\text{cm}^2$ and the central angle is $\theta = \frac{7\pi}{6}$ radians.



Your resources will appear in the box below.

Resources From Your Instructor

- Sample File
- Sample Link
- Sample Note

Text for students to read.

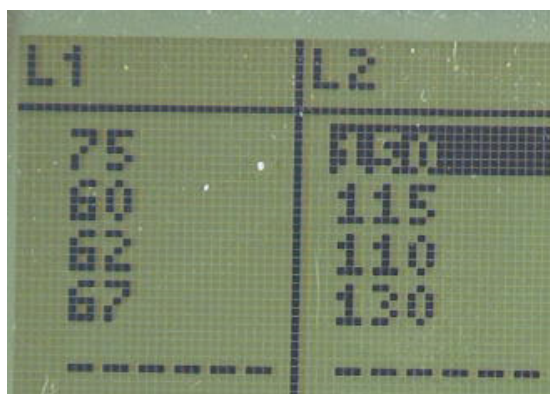
Victoria Justice

$$A = \frac{1}{2}r^2\theta$$
$$A = 23\text{cm}^2 \quad \theta = \frac{7\pi}{6}$$
$$23 = \frac{1}{2}r^2 \cdot \frac{7\pi}{6}$$
$$\frac{7\pi}{6} \cdot r^2 = 46$$
$$7\pi \cdot r^2 = 276$$
$$r^2 = \frac{276}{7\pi}$$
$$r > 0$$
$$r = \sqrt{\frac{276}{7\pi}}$$
$$r = 3.5$$

Project Overview

Enter Data

stat edit

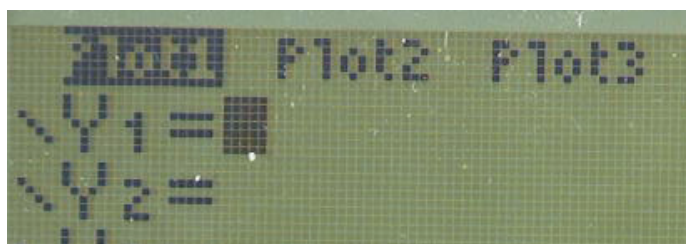


The image shows a TI-84 Plus calculator screen in the 'stat edit' mode. The screen is divided into two columns, L1 and L2, by a vertical line. The top row is labeled 'L1' and 'L2'. Below the labels, the numbers 75, 80, 85, and 87 are listed vertically in the L1 column. In the L2 column, the numbers 110, 115, 119, and 130 are listed vertically. The numbers in the L2 column are highlighted with a dark background, indicating they are currently being edited.

L1	L2
75	110
80	115
85	119
87	130

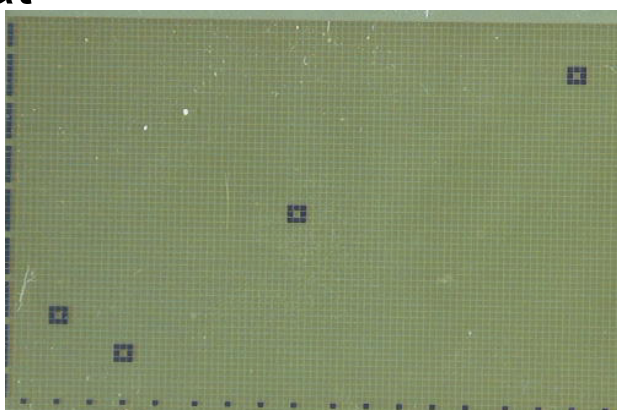
Plot

$y = x^2$ enter



turns on plots

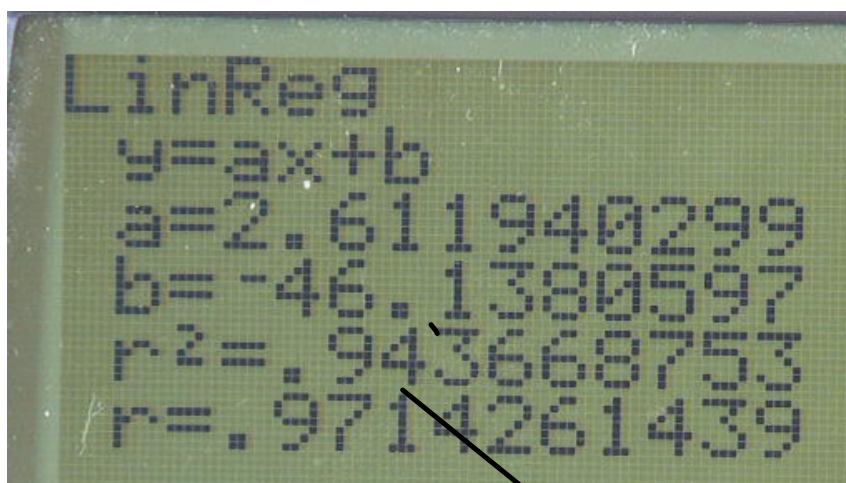
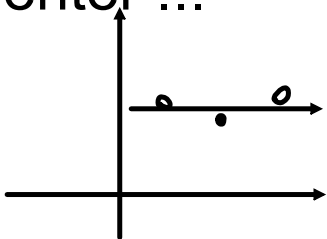
zoom 9 : zoomstat



Finding Regressions

stat > calc 4: Linear

enter ...



To get r =

catalog (2nd 0) arrow down to
"diagnosticON"

enter ..

94%
corr

Evaluate and Solve

Y(72)=calc 1:, vars, trace, table

220= Y(x) solver, intersection, hand

both? Go to solver Math 0: (B)

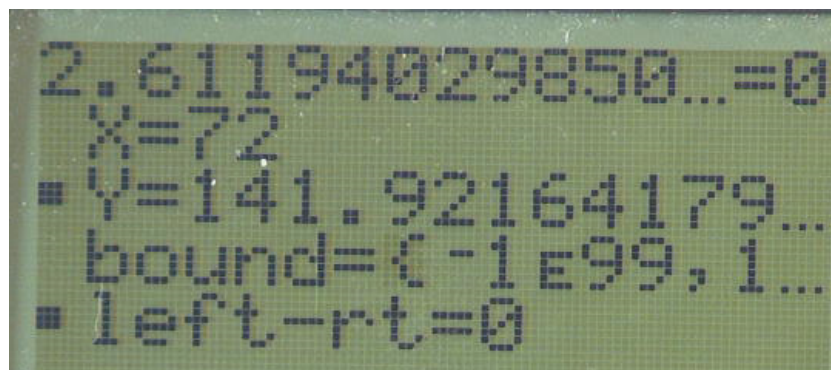
var 5: > > 1: regeq (copies in last regression)
minus Y (alpha 1)



EQUATION SOLVER
eqn: 0 = 2.61194029
85075X + -46.13805
97015 - Y

x= 72

y=0 (alpha enter)



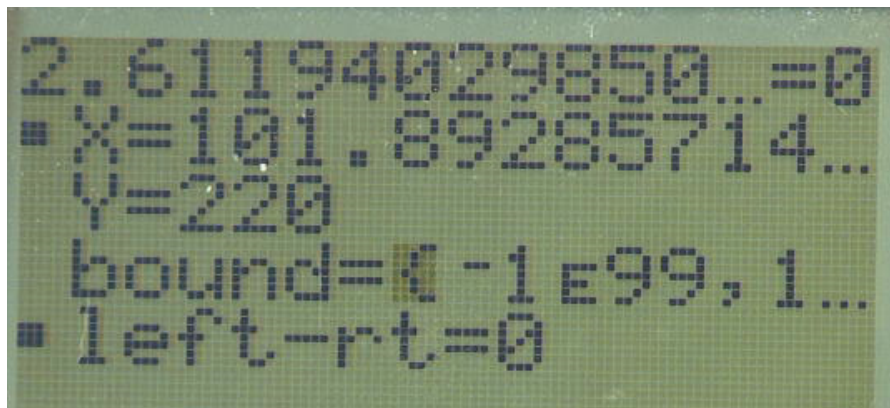
2.61194029850... = 0
X = 72
Y = 141.92164179...
bound = (-1E99, 1...
left - rt = 0

According to the linear regression, a person of 72 inches should weigh 141 lbs.

Solve,

$Y = 220 \text{ lbs}$

$x = 72$ (alpha) (enter)



```
2.61194029850...=0
X=101.89285714...
Y=220
bound=1-1E99, 1...
left-rt=0
```

A person of 220 lbs should be over 8 foot
(according to the linear regression)

Repeat for all the regressions!

```
QuadReg
y=ax2+bx+c
a=.0412180053
b=-2.967255075
c=141.1624007
R2=.9473757936
```

```
CubicReg
y=ax3+bx2+cx+d
a=-.0695970696
b=14.08241758
c=-943.5732601
d=21065.65934
R2=1
```

2 points = line

3 points = quartic

4 points cubic

5 points = quartic

ExpReg

$$y = a * b^x$$

$$a = 33.2852456$$

$$b = 1.020290709$$

$$r^2 = .9315020862$$

$$r = .9651435573$$

LnReg

$$y = a + b \ln x$$

$$a = -608.7483142$$

$$b = 175.5884504$$

$$r^2 = .9390026143$$

$$r = .9690214726$$

SinReg

$$y = a * \sin(bx + c) + d$$

$$a = 22.62225067$$

$$b = .1396263402$$

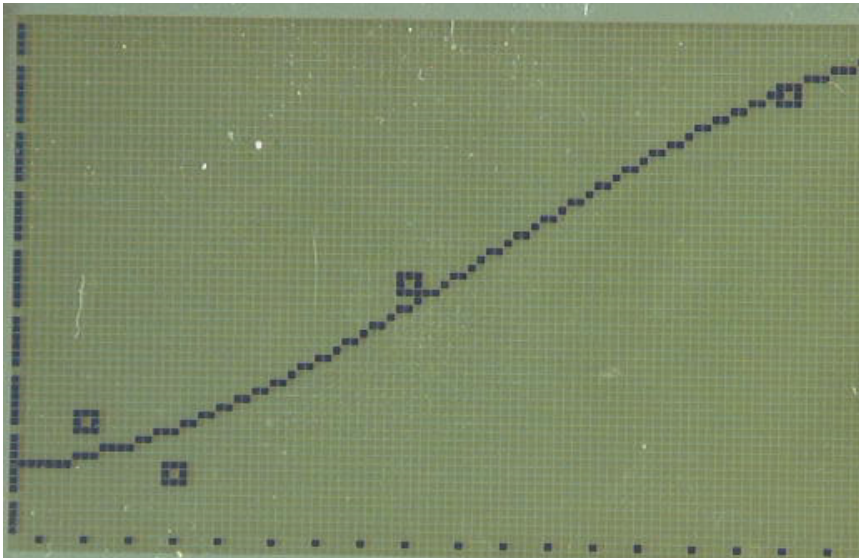
$$c = 2.987897982$$

$$d = 132.8745623$$

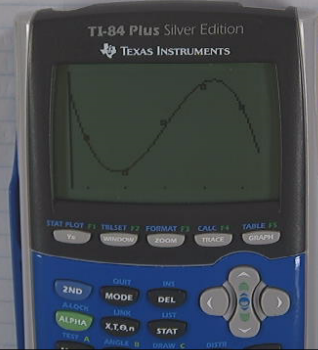
Graph the regressions

$$y = \text{var } 5 \gg 1$$

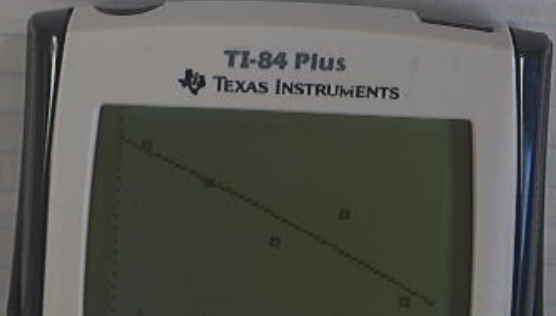
graph



According to the Cubic Reg. apple stock will cost \$5.4
share in 2017.



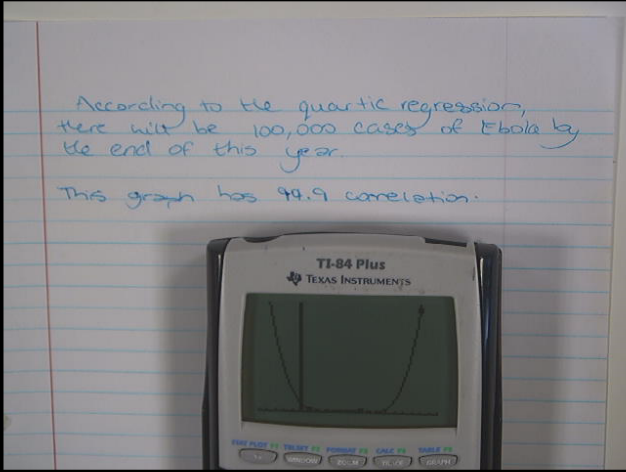
- Next year, in 2017, using quadratic regression, a TB will cost 26.7.
- Next year, in 2017, using linear regression, a TB will cost 26.2.



SDP960 USB Viewer ID: 446-115-3665 Stop Share

Function(F) View(V) Option(O) Help(H)

SXGA XGA VGA 50% 100% Fit Stretch Full VGA 30FPS 00:00:00 Qsaw Still Set Rec Stop Set Ctrl Panel Tool Bar Talking:



According to the quartic regression,
there will be 100,000 cases of Ebola by
the end of this year.

This graph has 99.9 correlation:

TI-84 Plus
TEXAS INSTRUMENTS

C:\Samsung Techwin\SDP960 USB Viewer\AVI

5:15 PM
10/19/2016

Detailed description: The image shows a screenshot of a video player window titled 'SDP960 USB Viewer'. The window has a menu bar with 'Function(F)', 'View(V)', 'Option(O)', and 'Help(H)'. Below the menu is a toolbar with various icons for video control (play, stop, full screen, etc.) and a 'Talking:' input field. The main content area displays a video of a TI-84 Plus calculator on a piece of lined paper. The paper has handwritten text in blue ink. The text reads: 'According to the quartic regression, there will be 100,000 cases of Ebola by the end of this year.' followed by 'This graph has 99.9 correlation:'. The calculator screen shows a graph of a parabola opening upwards. The bottom of the window shows the Windows taskbar with several application icons and the system clock displaying '5:15 PM 10/19/2016'.

Cubic Regression

99.5% correlation

in December 2016

there will be only

~~69~~

it will take until

June 2018 for

2 bids to reach

100,000

according
to x^3 req.

