



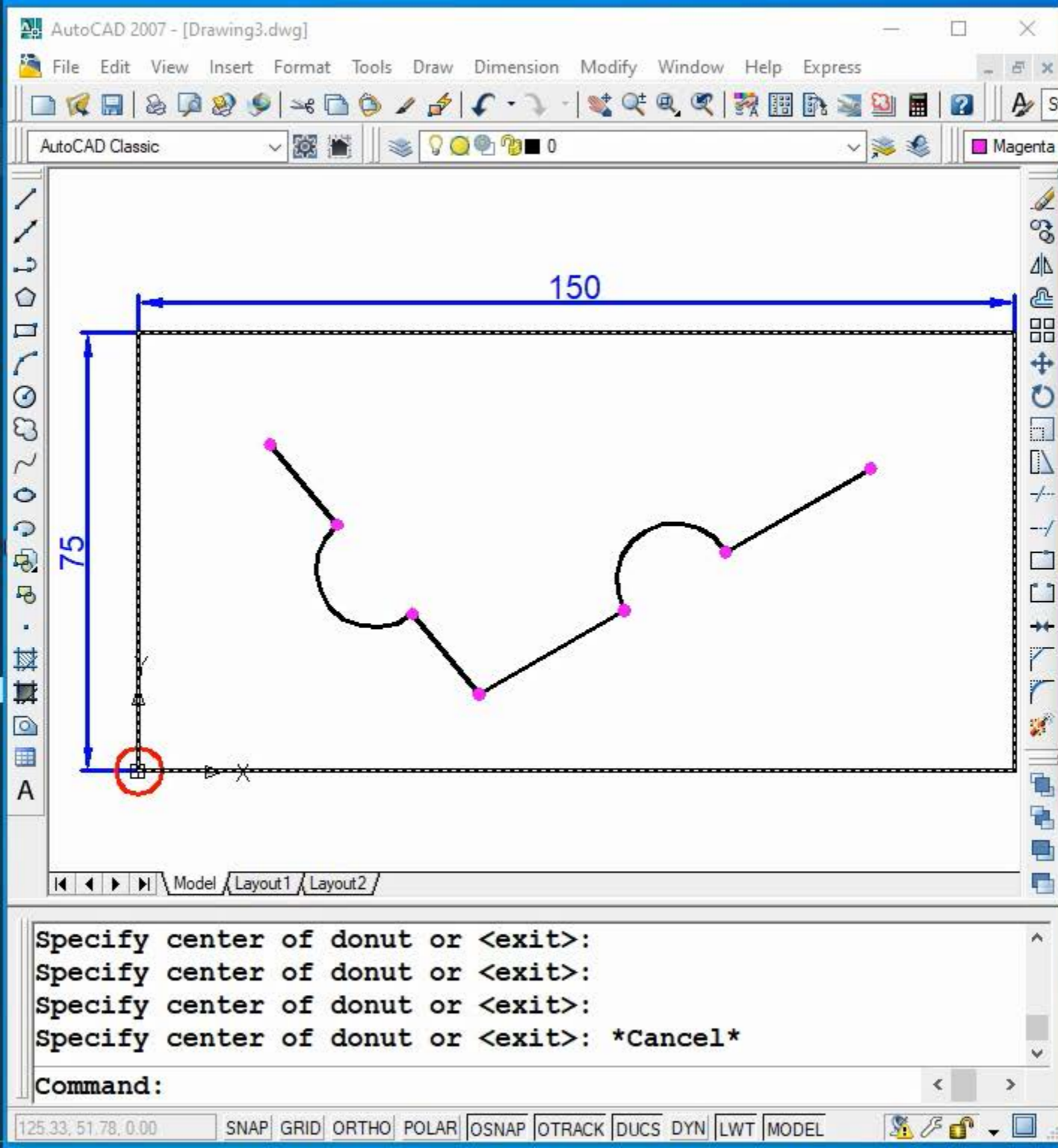
BİLECİK ŞEYH EDEBALI ÜNİVERSİTESİ

Uzaktan Eğitim Dersleri

MAK236 Bilgisayar Destekli Üretim

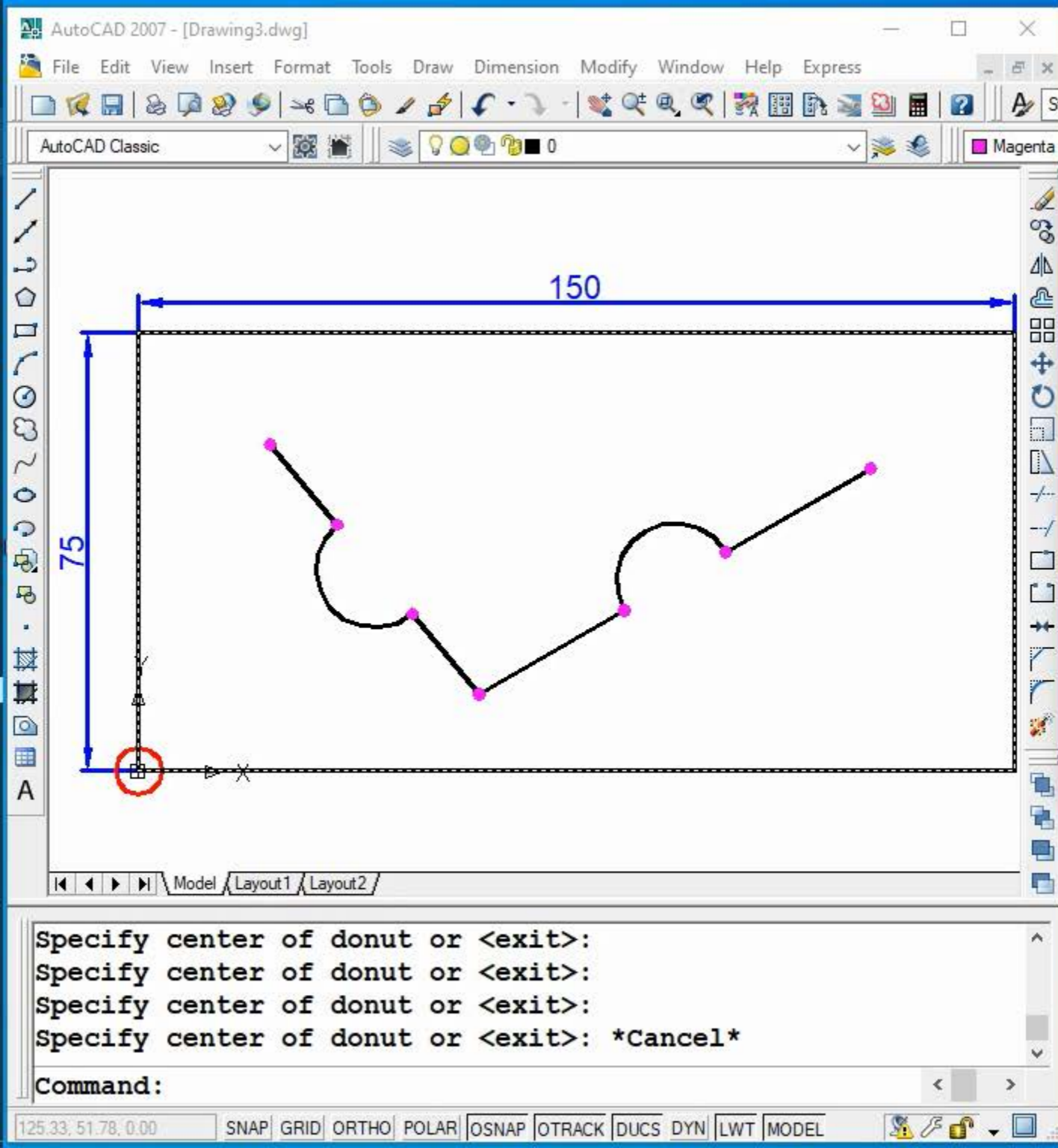
Öğr.Gör. Dr. Telat TÜRKYILMAZ

2020 Yılı Güz Dönemi



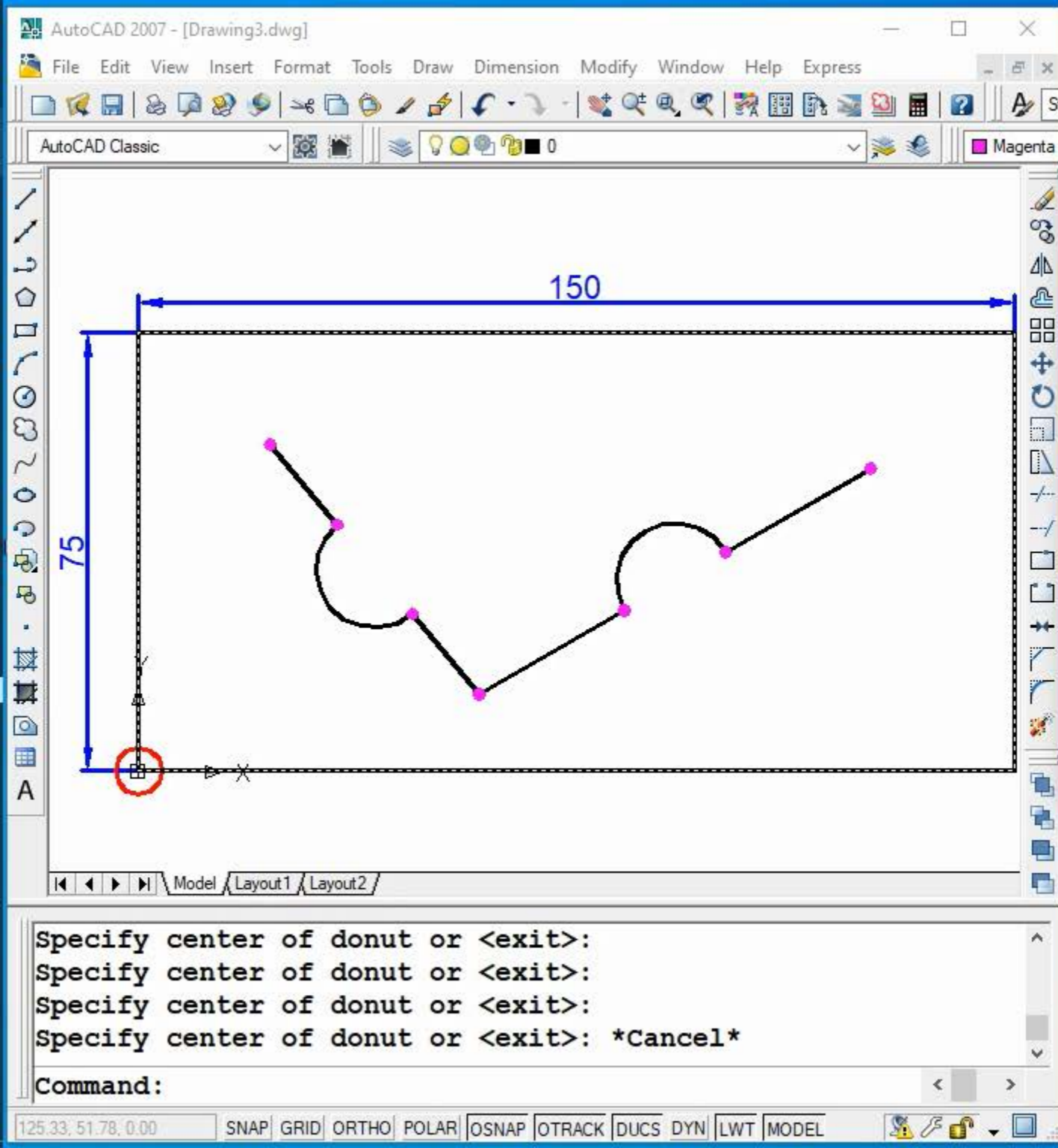
G90 ABSOLUTE PROGRAMLAMA



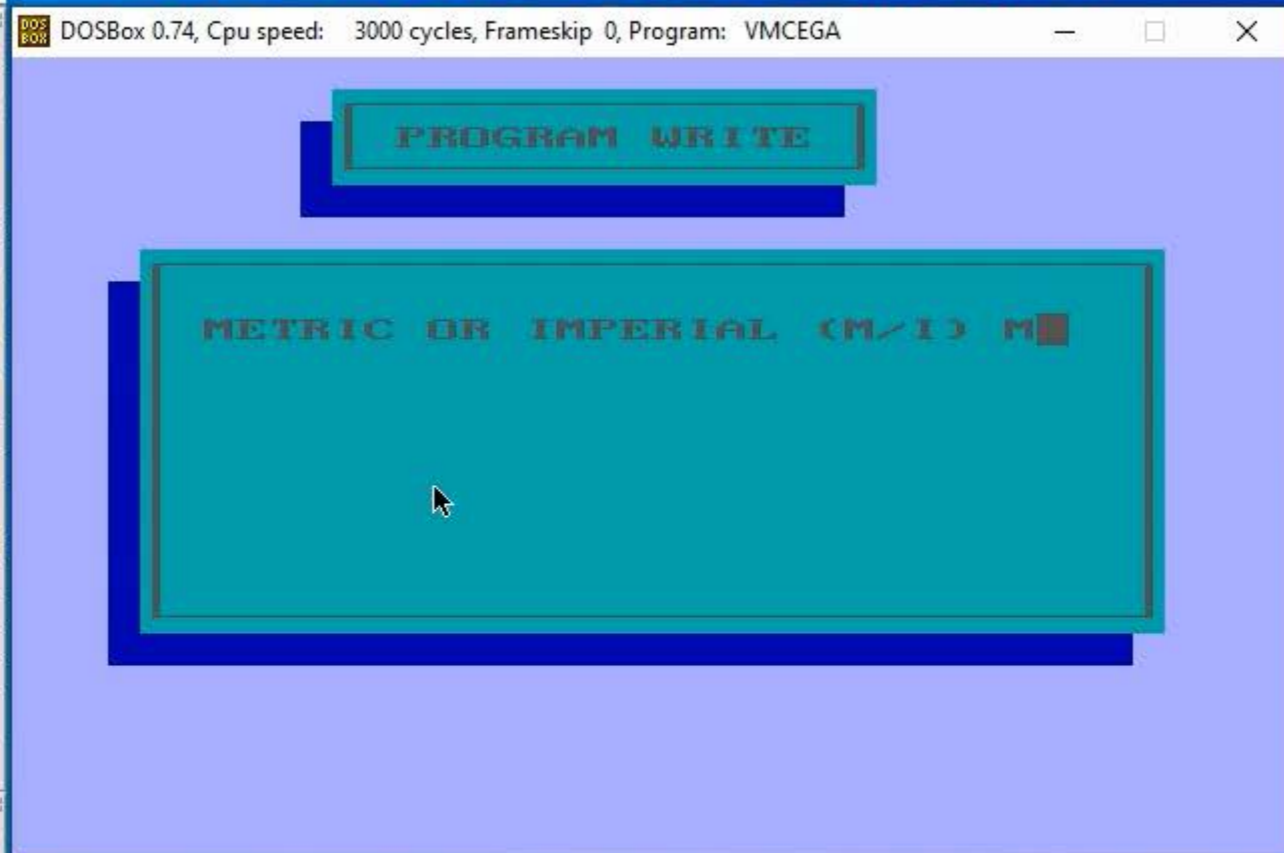


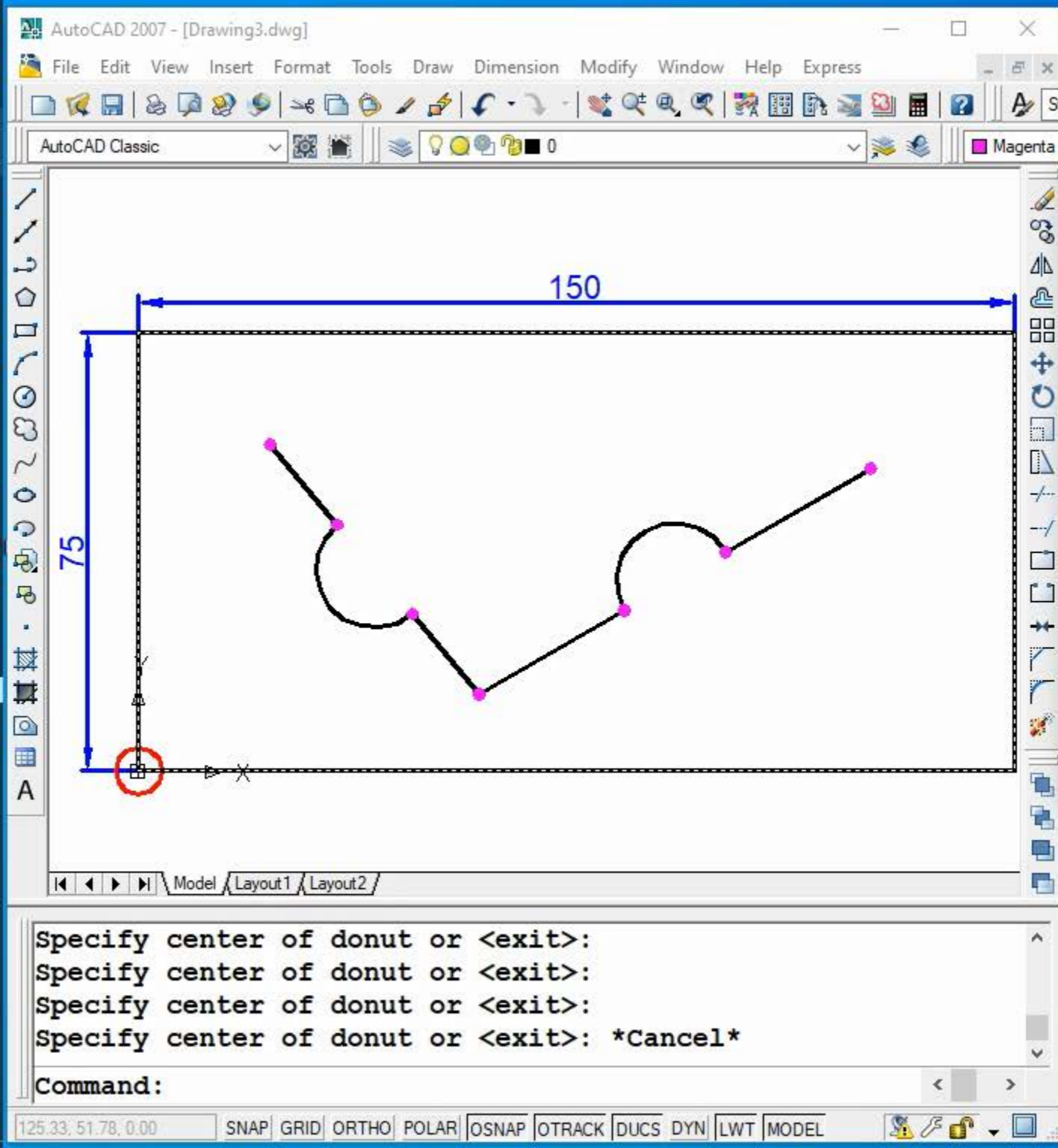
G90 ABSOLUTE PROGRAMLAMA



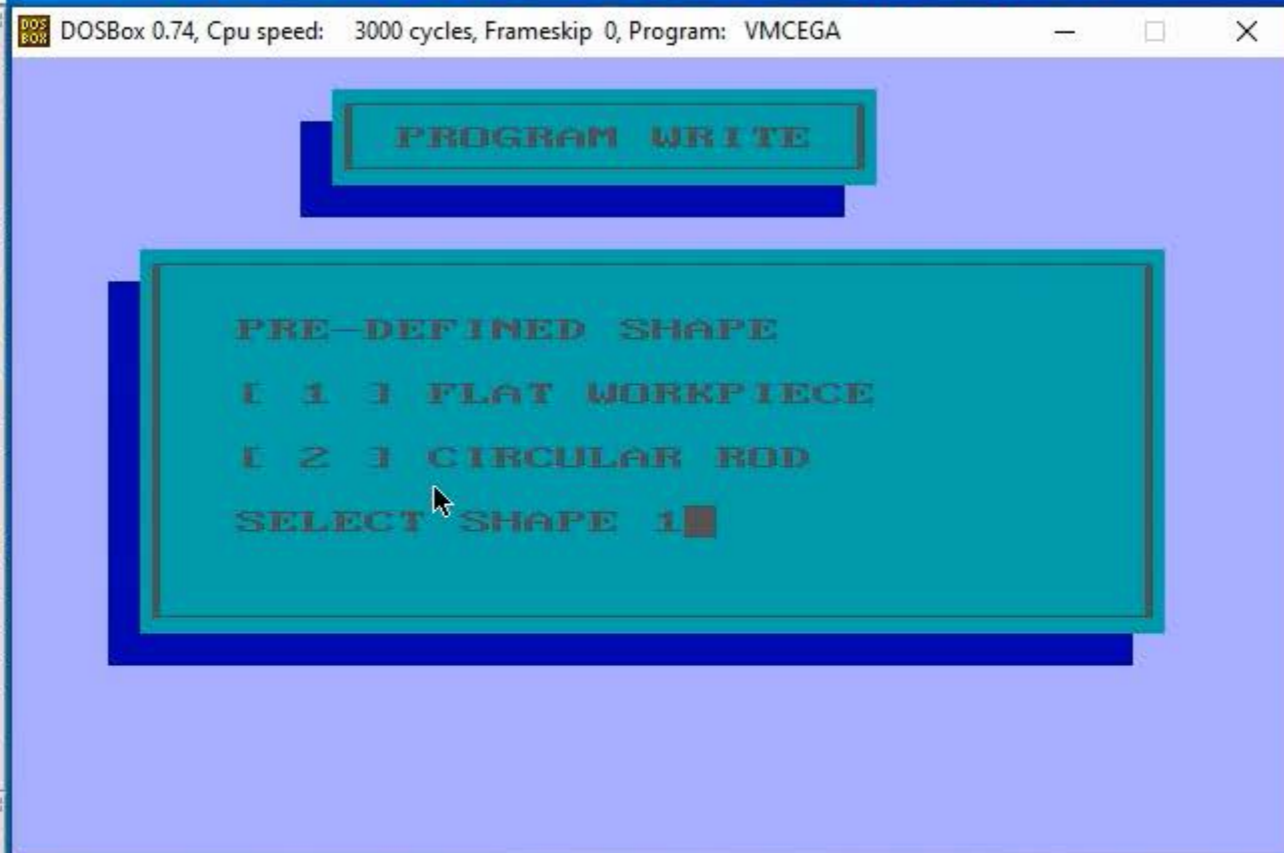


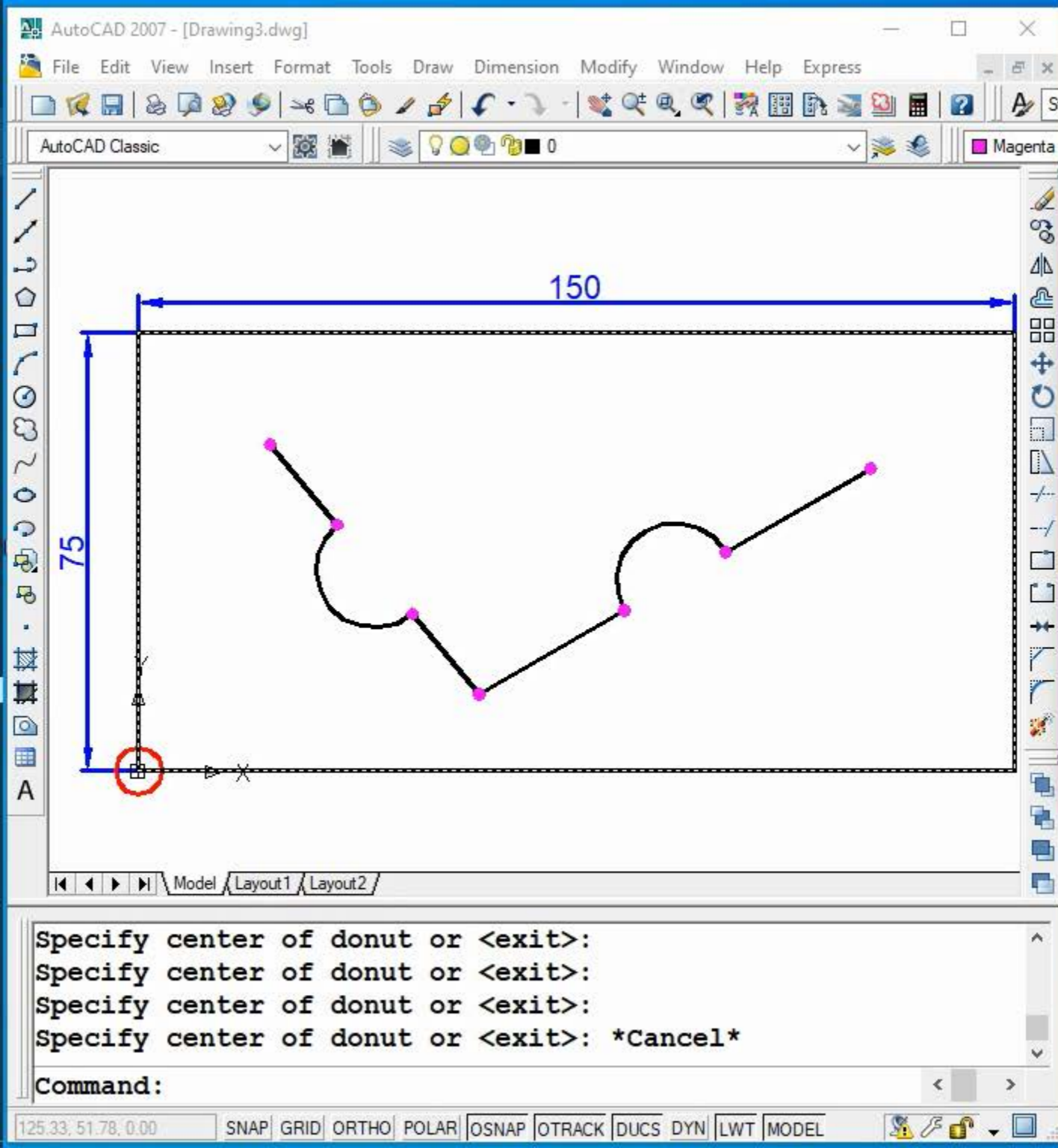
G90 ABSOLUTE PROGRAMLAMA



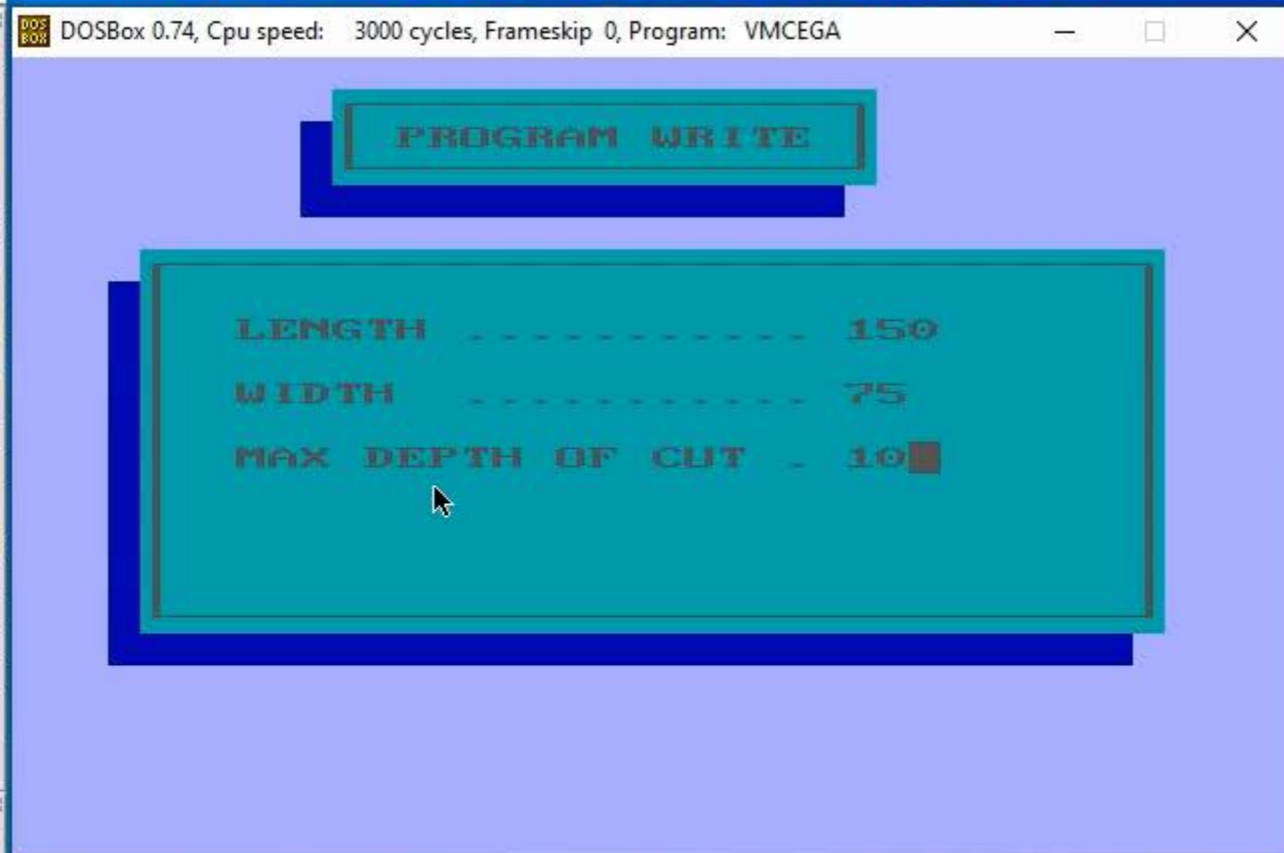


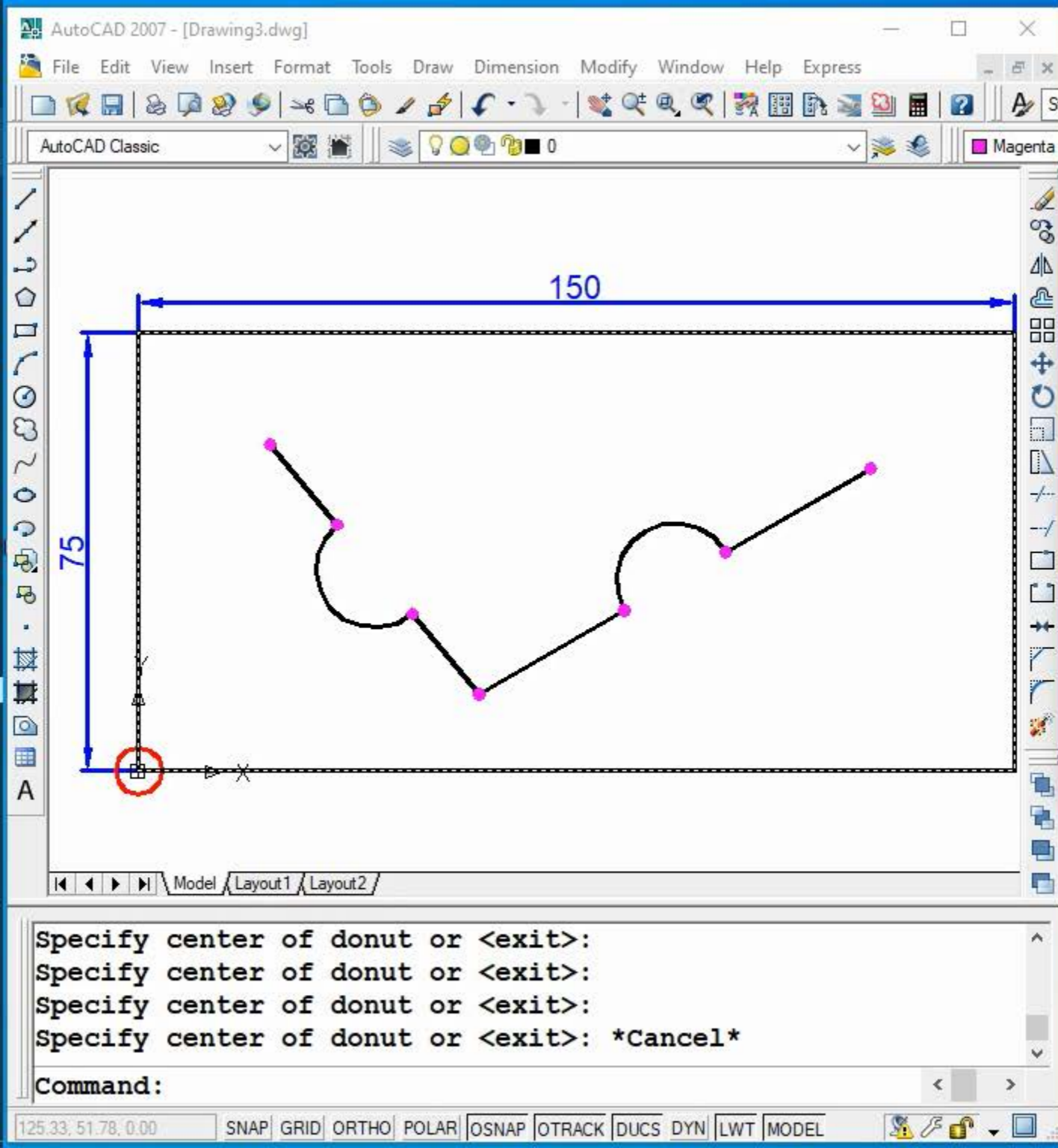
G90 ABSOLUTE PROGRAMLAMA



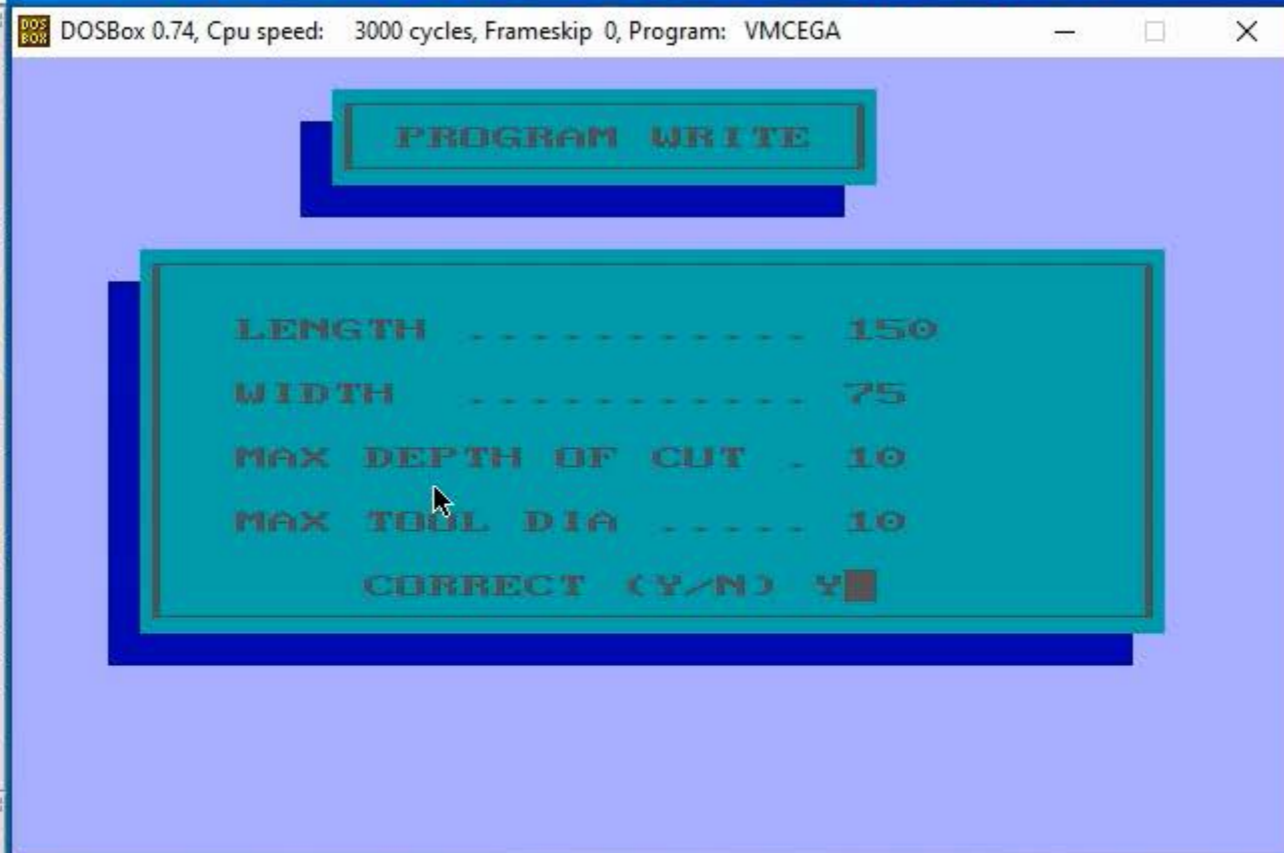


G90 ABSOLUTE PROGRAMLAMA



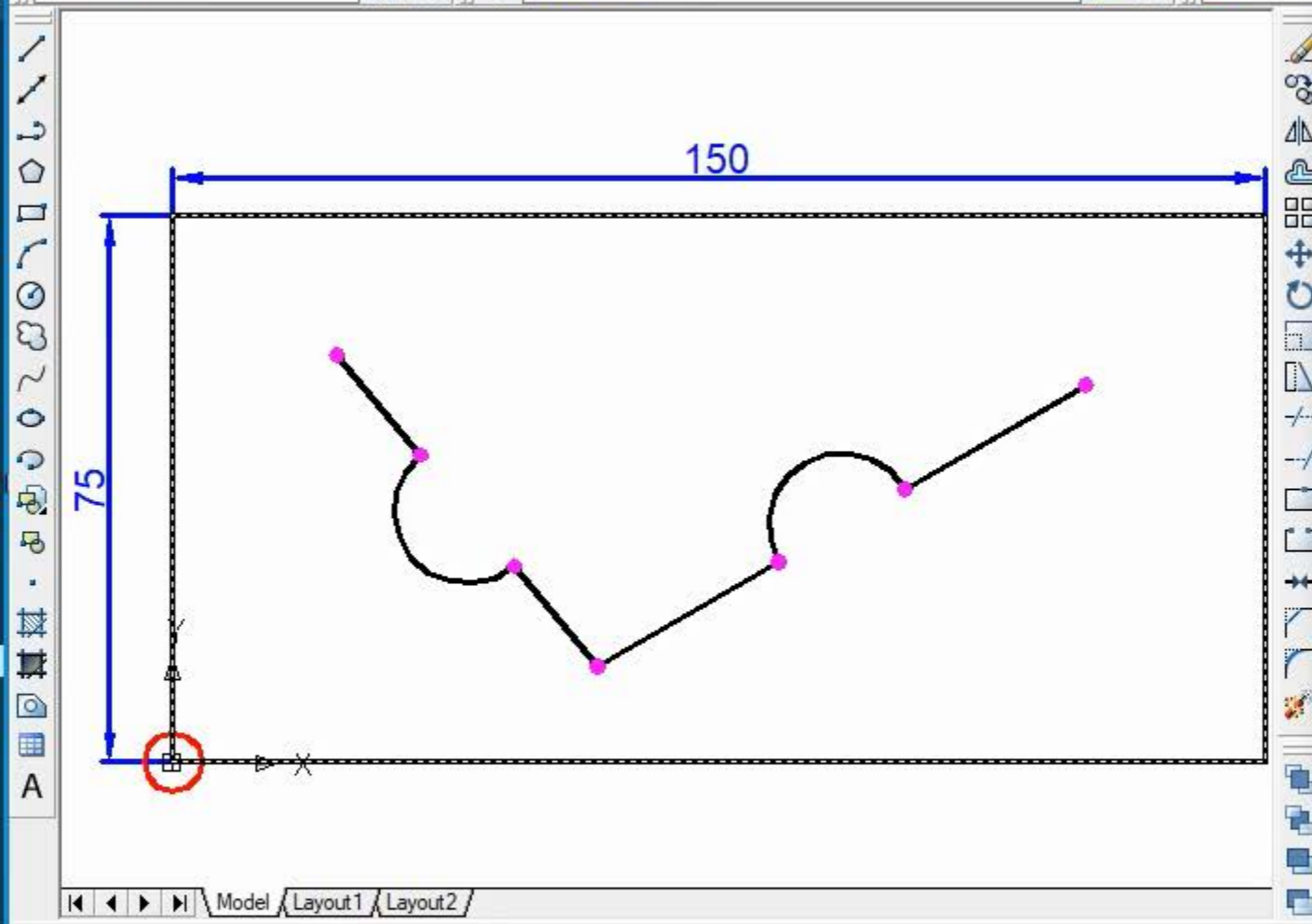


G90 ABSOLUTE PROGRAMLAMA





G90 ABSOLUTE PROGRAMLAMA



DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

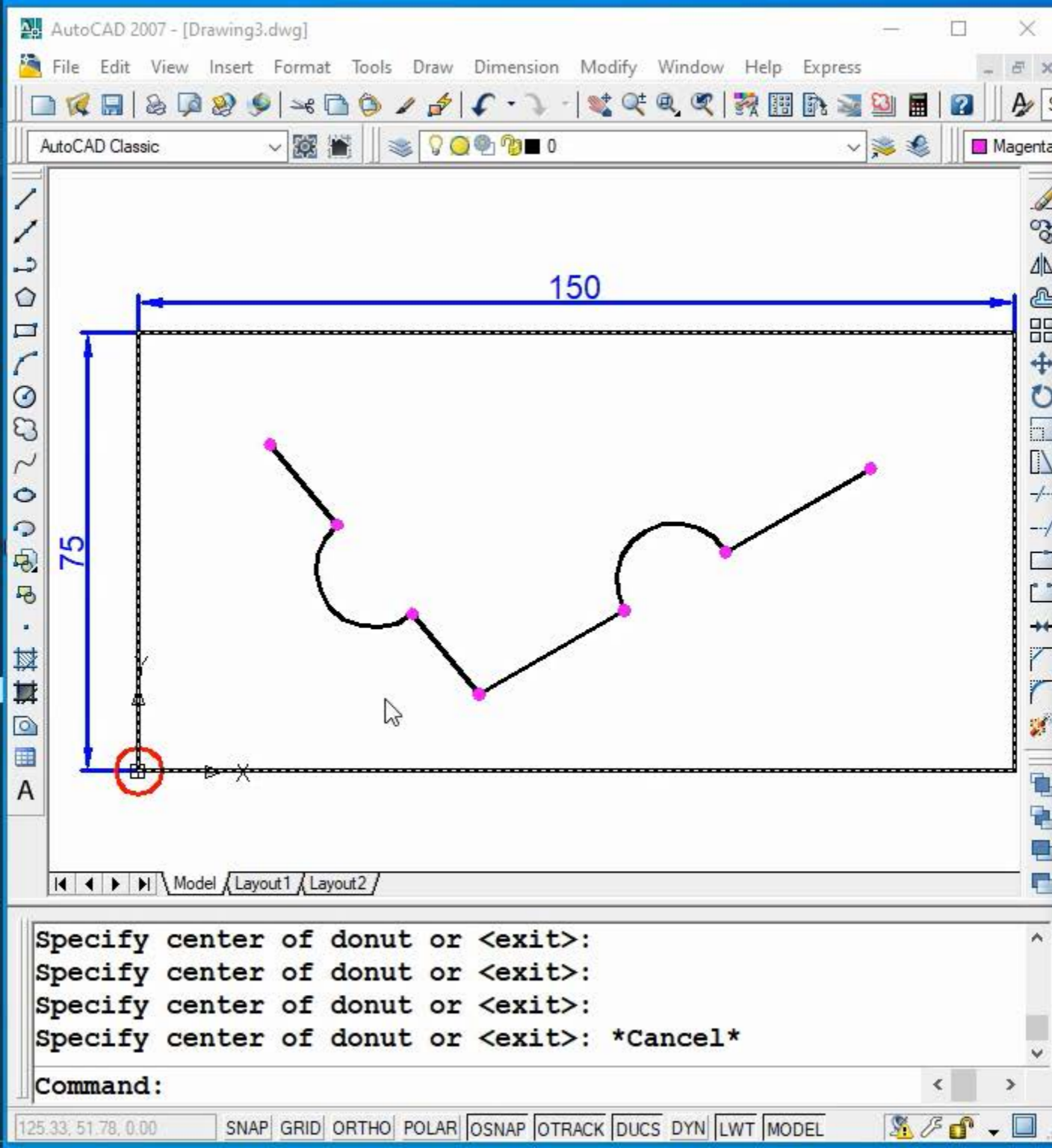
TYPE No.1 FACING CUTTER 25 mm DIAMETER	TYPE No.2 SLOT DRILL DIAMETER 3-6 mm AND RANGE 10,12,16 mm	TYPE No.3 RIPPER CUTTER DIAMETER RANGE 8,10,12,16 mm	TYPE No.4 SPOT DRILL DIAMETER RANGE 6 AND 10 mm
TYPE No.5 BALL END CUTTER DIAMETER RANGE 6 AND 10 mm	TYPE No.6 T/SLOT CUTTER DIAMETER 12.5 mm HEIGHT 6 mm	TYPE No.7 DOVETAIL CUTTER DIAMETER 16 mm ANGLE 60 DEGREES	TYPE No.8 DRILL UP TO 12.5 mm DIAMETER
TYPE No.9 UNDEFINED	TYPE No.10 END MILL DIAMETER 3-6 mm AND RANGE 10,12,16 mm	TYPE No.11 BORING HEAD	TYPE No.12 UNDEFINED

PRESS ANY KEY TO CONTINUE

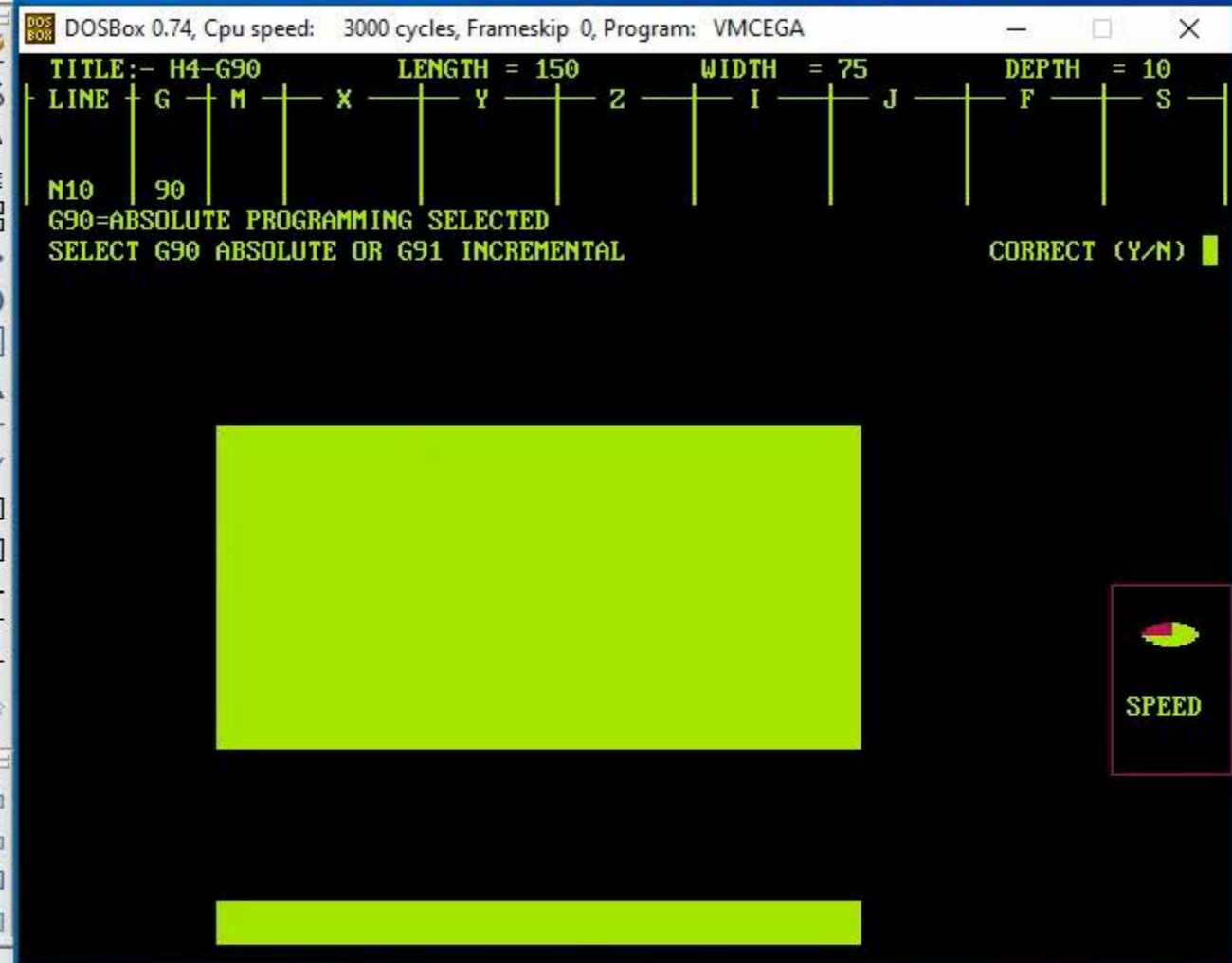
```
Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>: *Cancel*

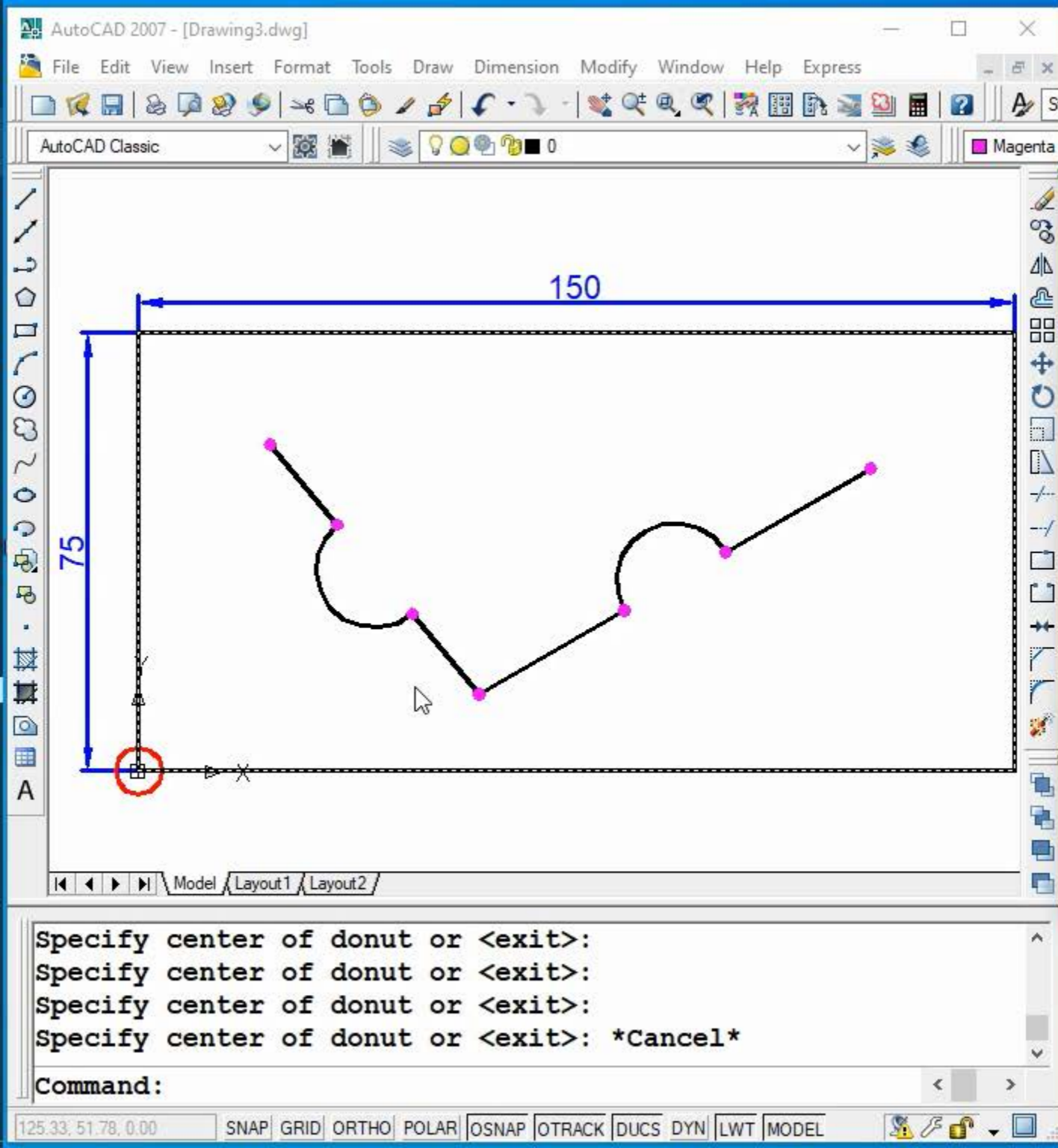
Command:

125.33, 51.78, 0.00  SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
```

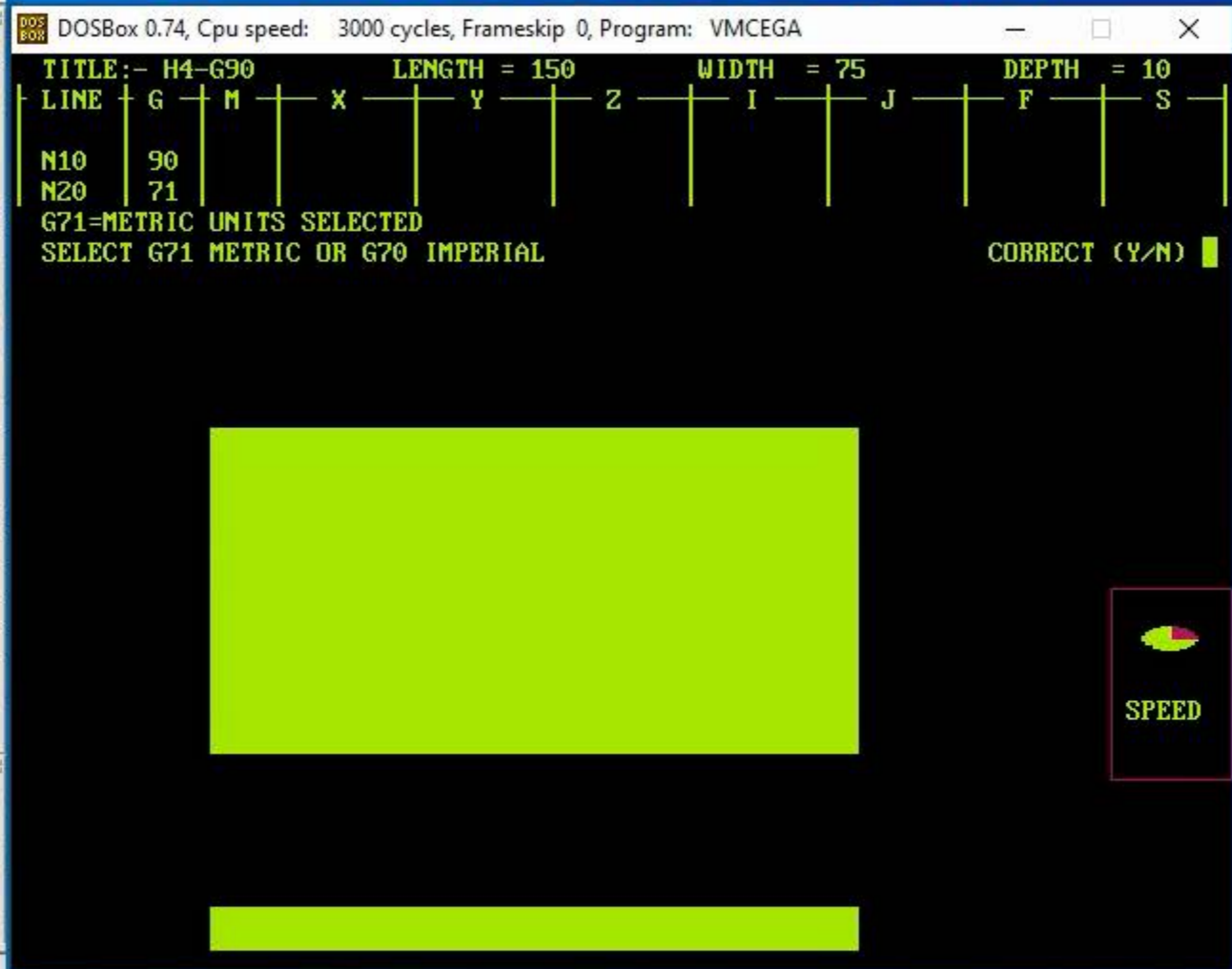


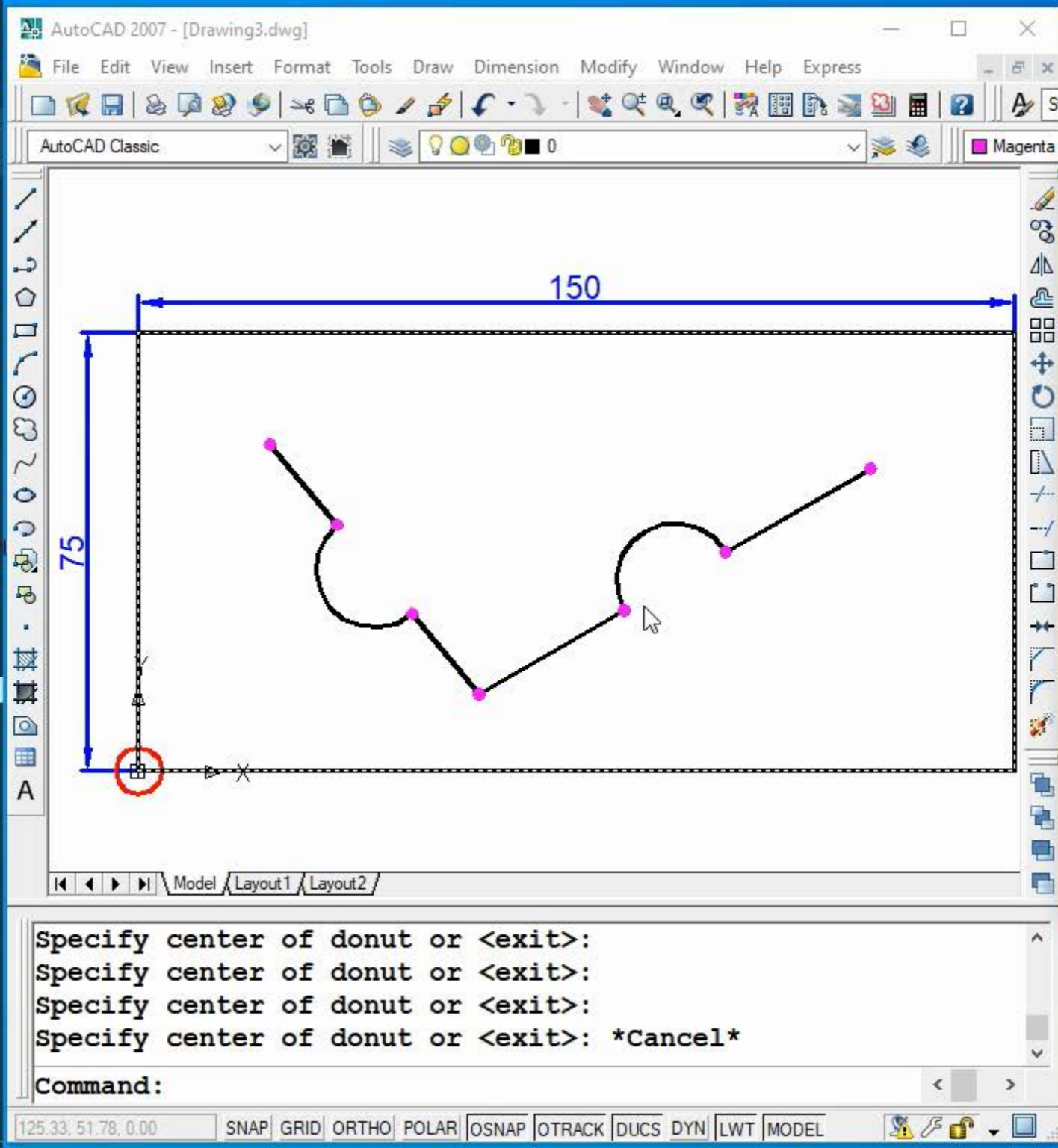
G90 ABSOLUTE PROGRAMLAMA



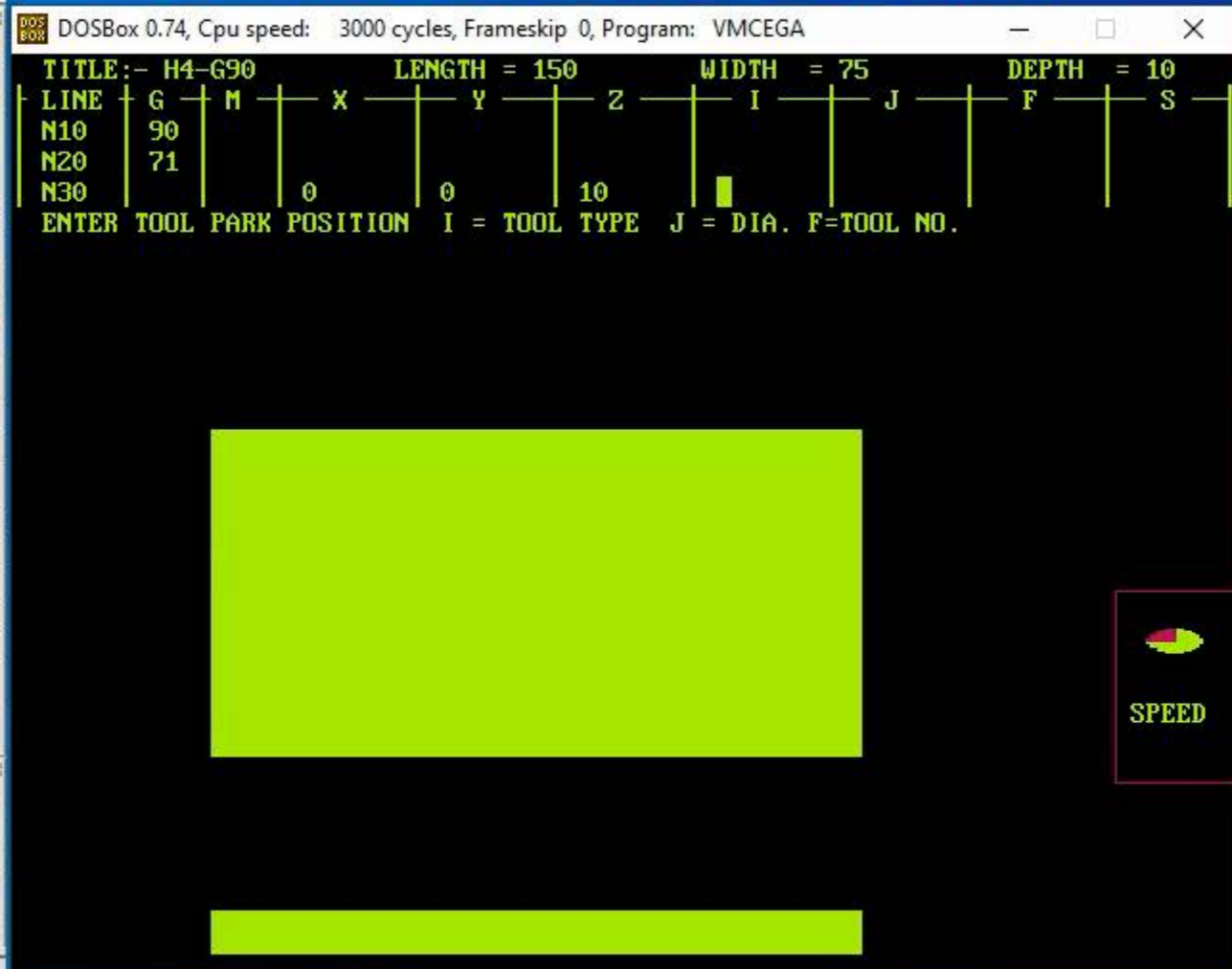


G90 ABSOLUTE PROGRAMLAMA





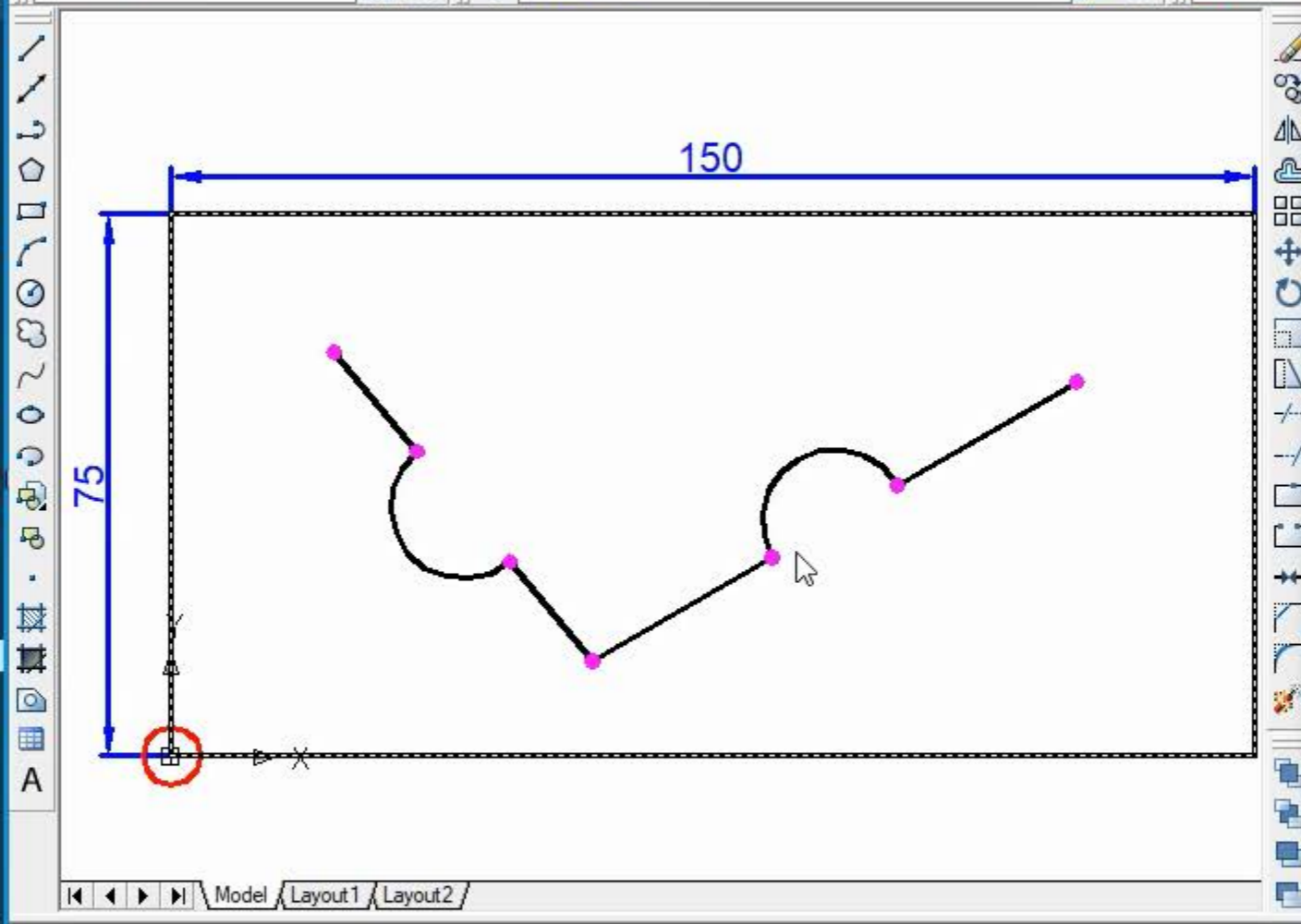
G90 ABSOLUTE PROGRAMLAMA





G90 ABSOLUTE PROGRAMLAMA

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA  
G83:-G83=DRILLING CYCLE WITH PECK (2mm OR .1" 'Z' AXIS STANDOFF)  
G85:-G85=BORING CYCLE SPINDLE STOP (2mm OR .1" 'Z' AXIS STANDOFF)  
G86:-G86=P.C.D DRILLING CYCLE (2mm OR .1" 'Z' AXIS STANDOFF)  
G87:-G87=DISH MILLING CYCLE (2mm OR .1" 'Z' AXIS STANDOFF)  
G88:-G88=RECTANGLE MILLING CYCLE (2mm OR .1" 'Z' AXIS STANDOFF)  
G89:-G89=CIRCLE MILLING CYCLE (2mm OR .1" 'Z' AXIS STANDOFF)  
G90:-G90=ABSOLUTE PROGRAMMING (FROM DATUM POSITION)  
G91:-G91=INCREMENTAL PROGRAMMING (FROM LAST POSITION)  
  
RETURN
```



Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>: *Cancel*
Command:
125.33, 51.78, 0.00 SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL



G90 ABSOLUTE PROGRAMLAMA

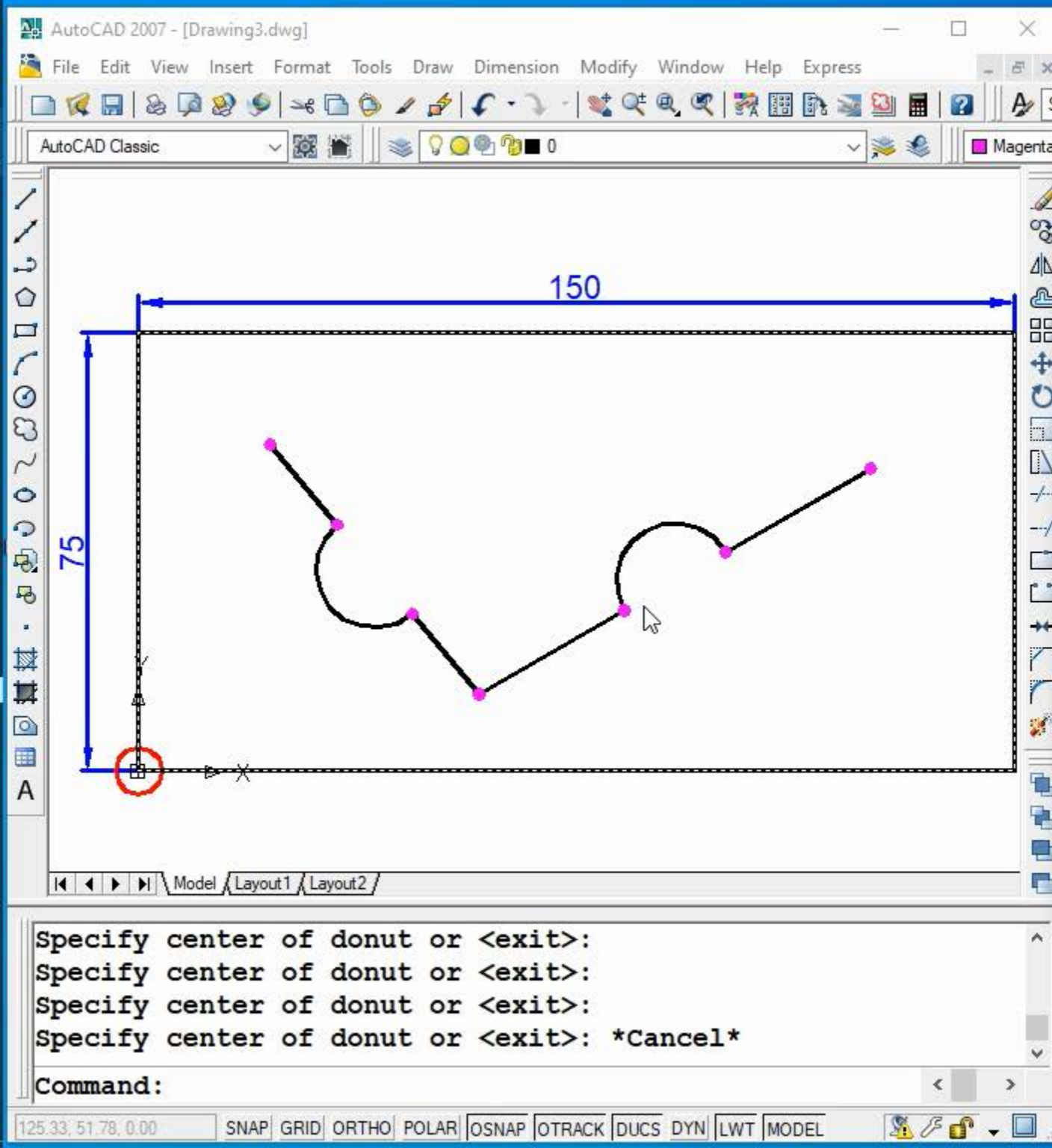
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

TYPE No.1 FACING CUTTER 25 mm DIAMETER	TYPE No.2 SLOT DRILL	TYPE No.3 RIPPER CUTTER DIAMETER RANGE 8,10,12,16 mm	TYPE No.4 SPOT DRILL DIAMETER RANGE 6 AND 10 mm
TYPE No.5 BALL END CUTTER DIAMETER RANGE 6 AND 10 mm	TYPE No.6 T/SLOT CUTTER DIAMETER 12.5 mm HEIGHT 6 mm	TYPE No.7 DOVETAIL CUTTER DIAMETER 16 mm ANGLE 60 DEGREES	TYPE No.8 DRILL UP TO 12.5 mm DIAMETER
TYPE No.9 UNDEFINED	TYPE No.10 END MILL DIAMETER 3-6 mm AND RANGE 10,12,16 mm	TYPE No.11 BORING HEAD	TYPE No.12 UNDEFINED

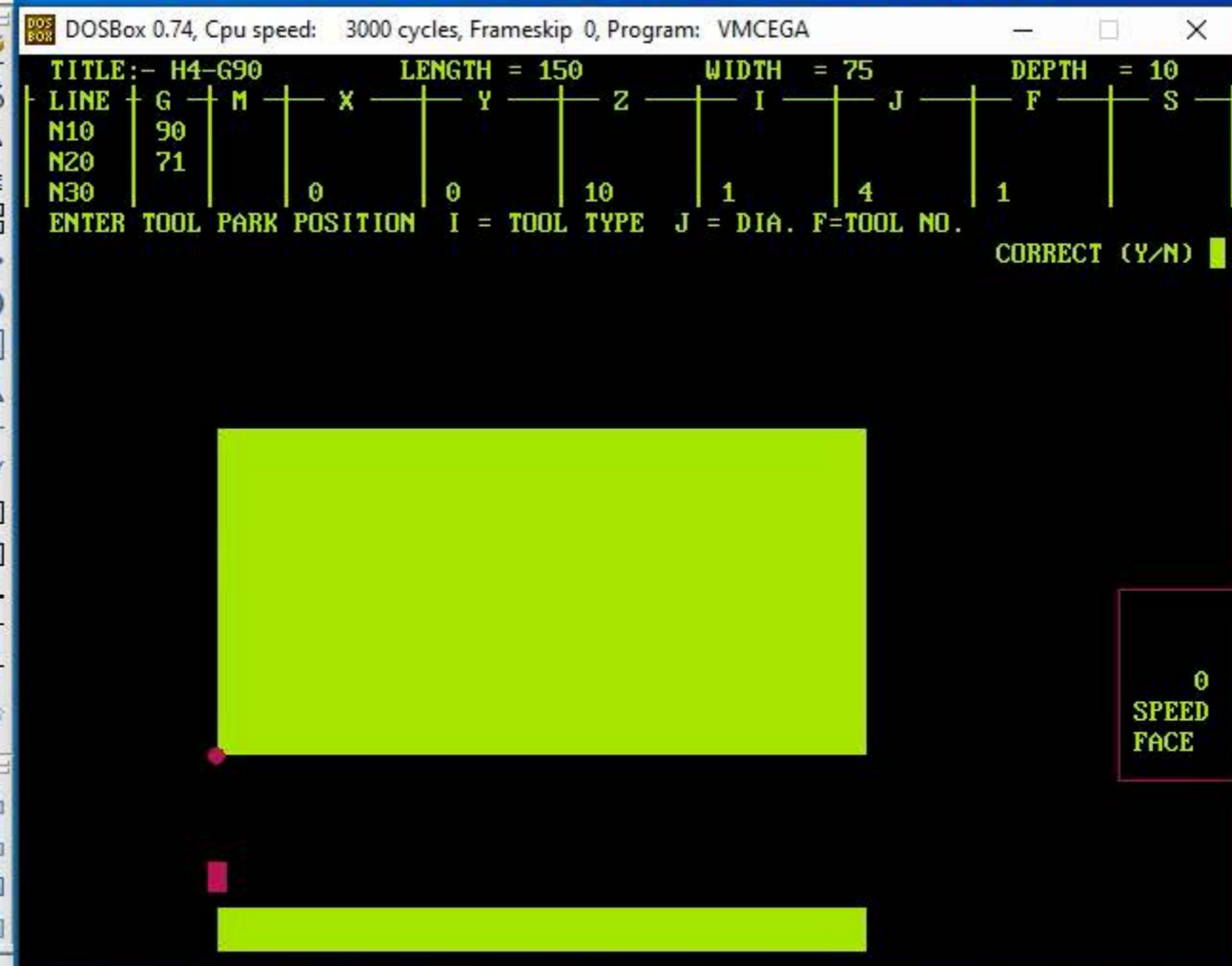
PRESS ANY KEY TO CONTINUE

```
Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>:
Specify center of donut or <exit>: *Cancel*

Command:
125.33, 51.78, 0.00  SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
```

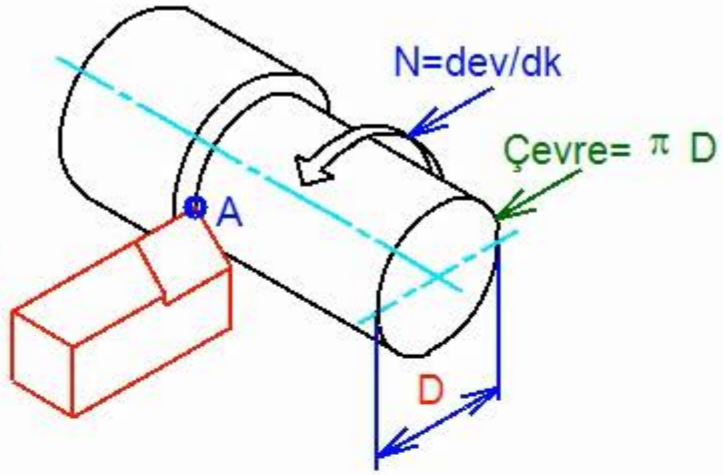


G90 ABSOLUTE PROGRAMLAMA



KESME HIZI HESAPLAMA

Sağ yan
torna
kalemi



Kesme hızı tanımı:

Kesici bir alet üzerindeki herhangi bir A noktasının dakikada metre cinsinden keserek aldığı yola KESME HIZI denir.

$$V = \pi D N \text{ mm / dak}$$

$$V = \frac{\pi D N}{1000} \text{ metre / dak}$$

*Tezgah hesaplanan devirden daha düşük bir devre ayarlanır.

G90 ABSOLUTE PROGRAMLAMA

Malzeme cinsi	HSS-Çelik kalemler		Sert metal kalemler	
	Kaba talaş	İnce talaş	Kaba talaş	İnce talaş
Ç1020-Ç1030	15-25	60-75	50-100	200-300
Ç1040-Ç1050	12-20	50-70	40-00	160-250
Ç1060-Ç1070	10-10	25-40	35-60	120-240
Çelik dökümler	10-10	25-40	35-60	120-240
Dökme demirler	10-20	30-45	45-70	90-150
Bronz ve kızıl döküm	45-60	00-130	200-300	350-400
Alüminyum ve alaşımları	80-120	100-150	150-300	250-400

$$V(\text{m/dk}) = 10$$

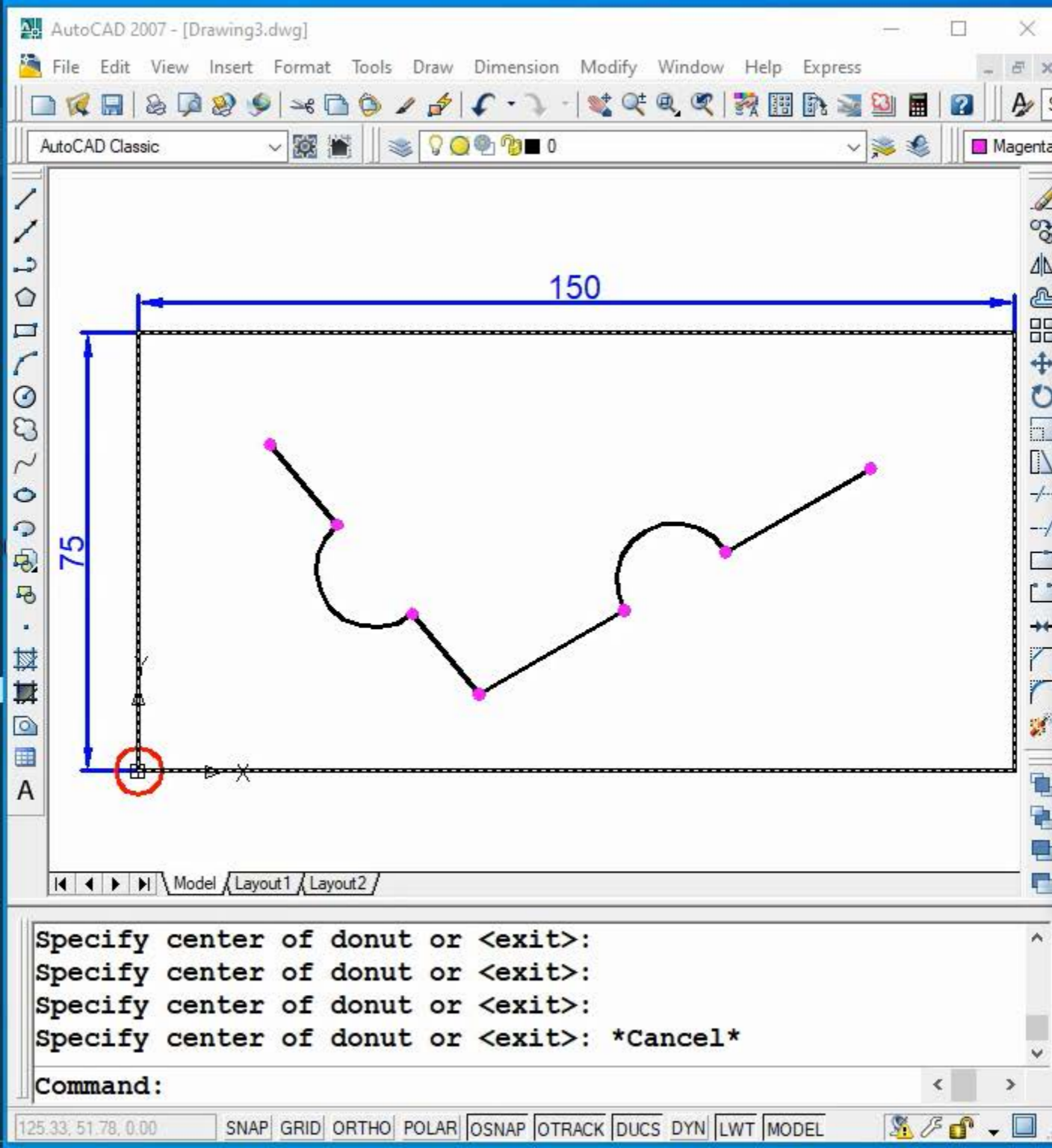
$$D(\text{mm}) = 4$$

YAZDIR

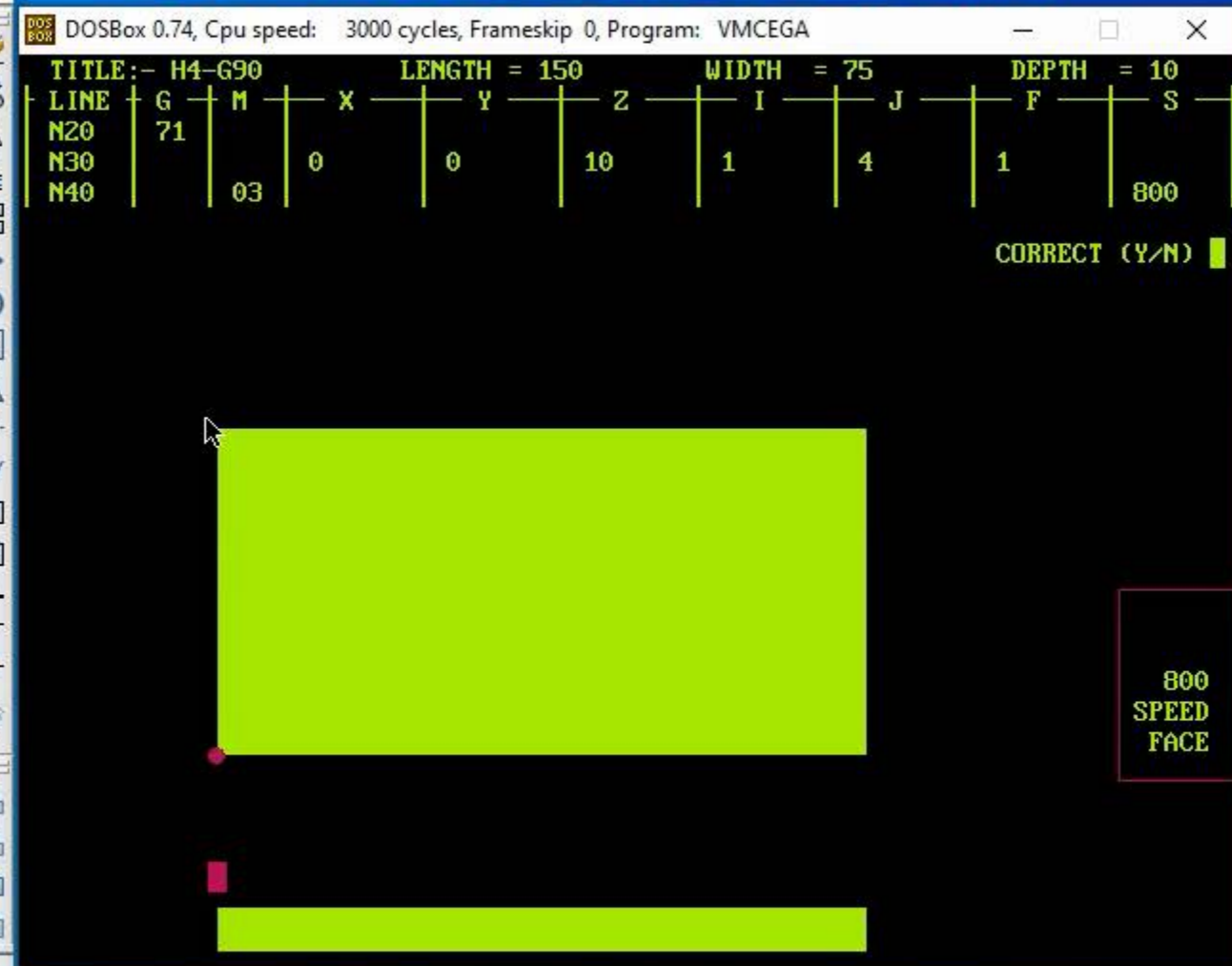
$$N = \frac{1000 V}{\pi D} = \frac{1000 \cdot 10}{\pi \cdot 4}$$

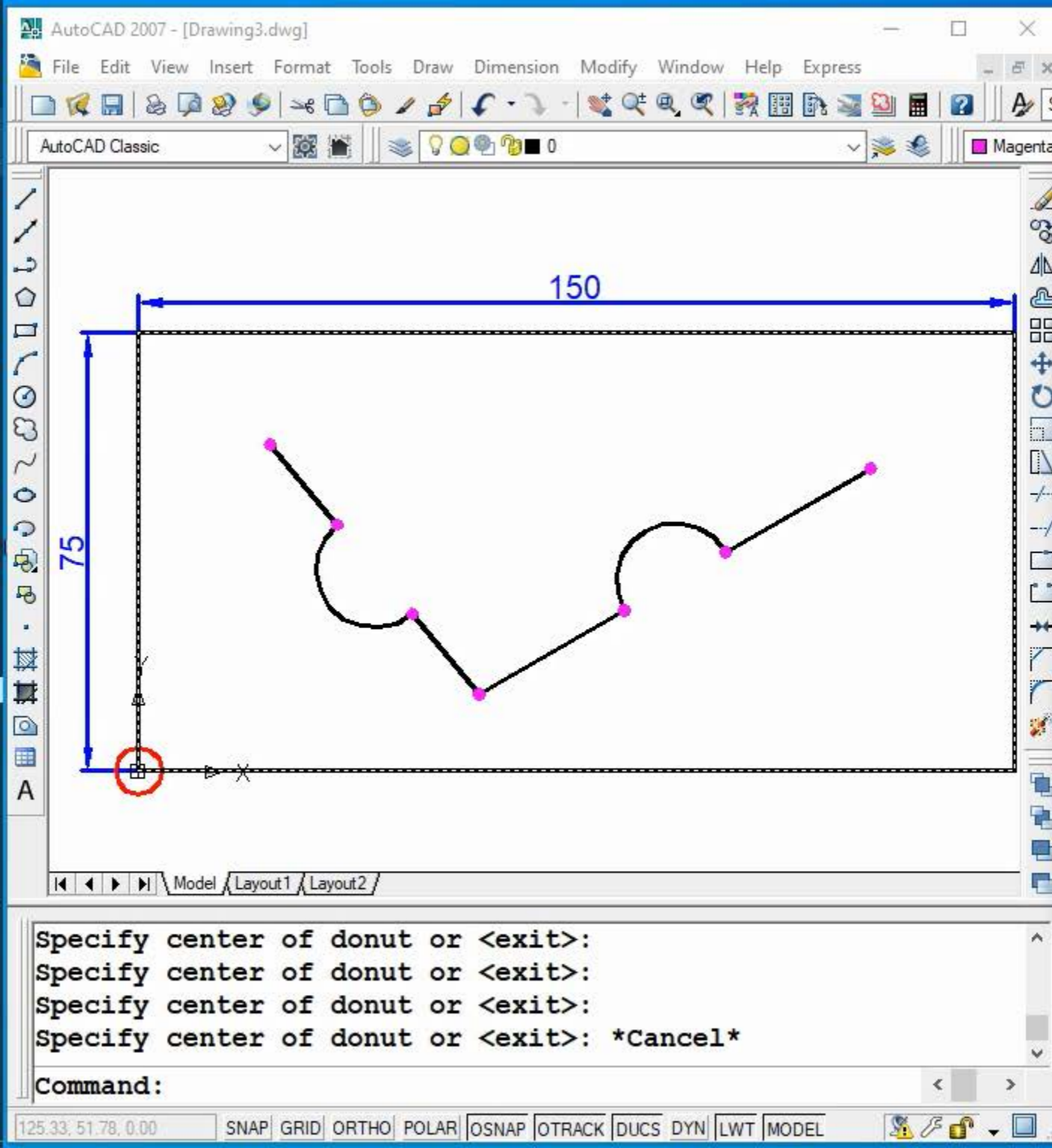
$$N = \frac{10000}{12,56}$$

$$N = 796,18 \text{ dev/dakika}$$

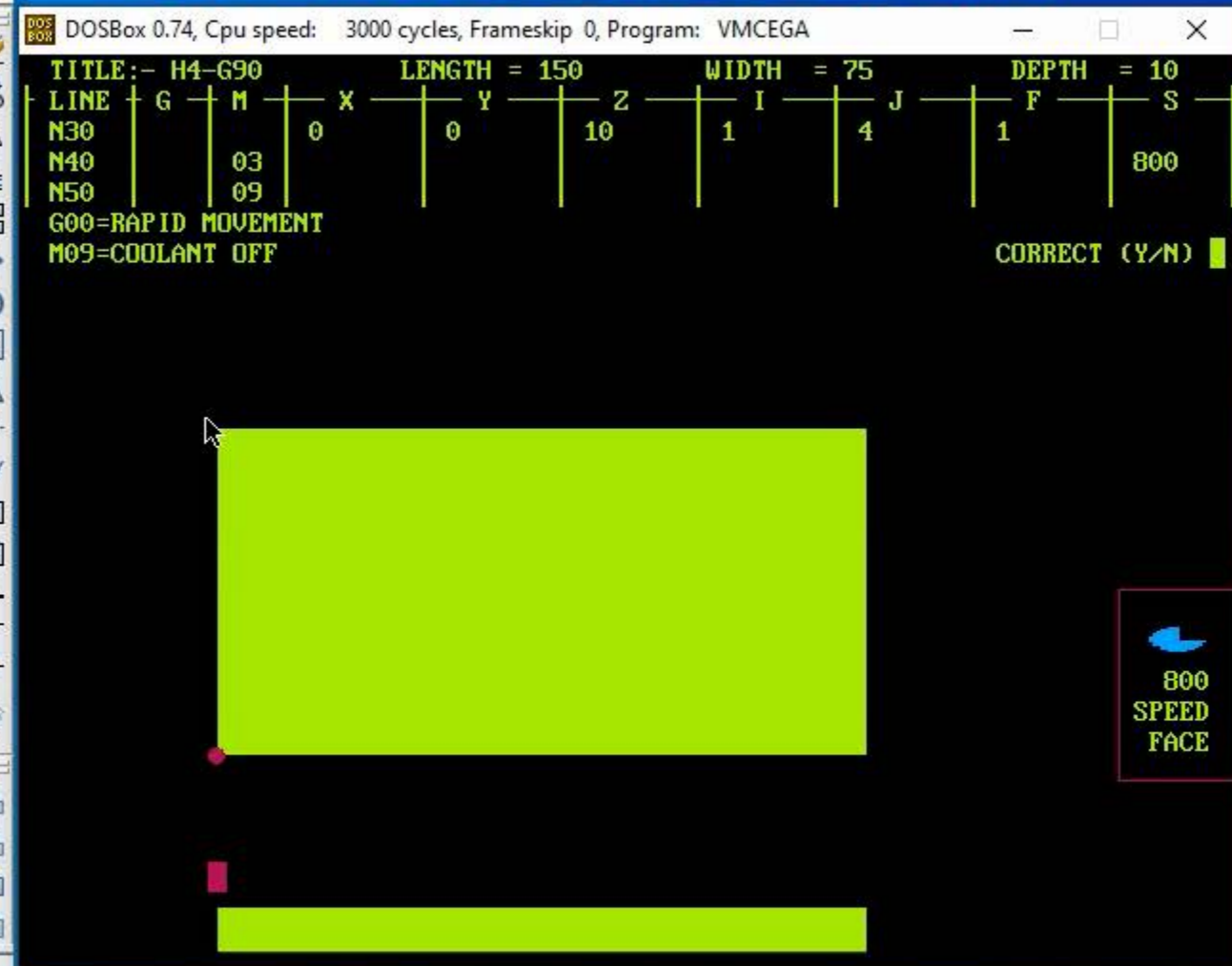


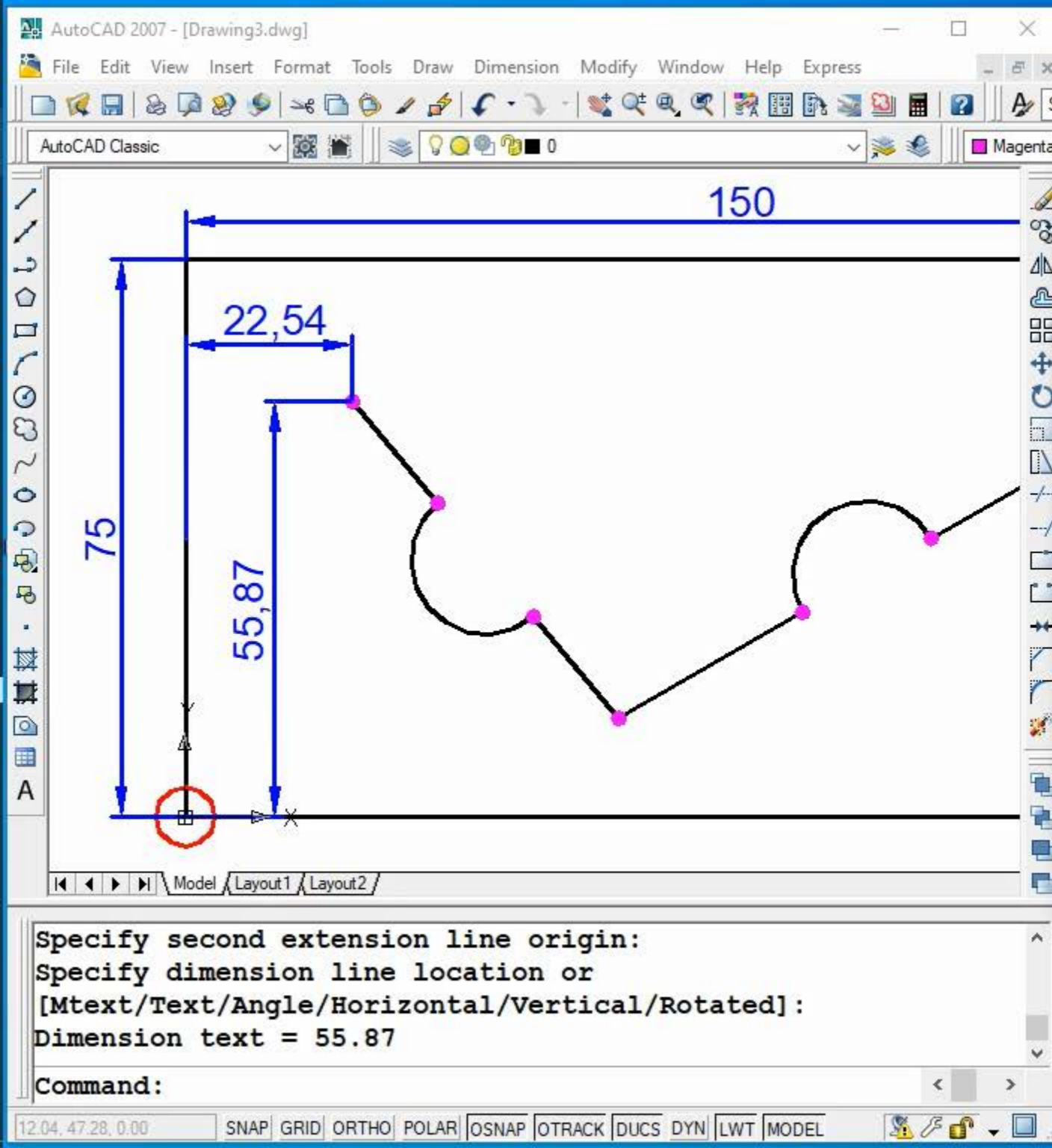
G90 ABSOLUTE PROGRAMLAMA





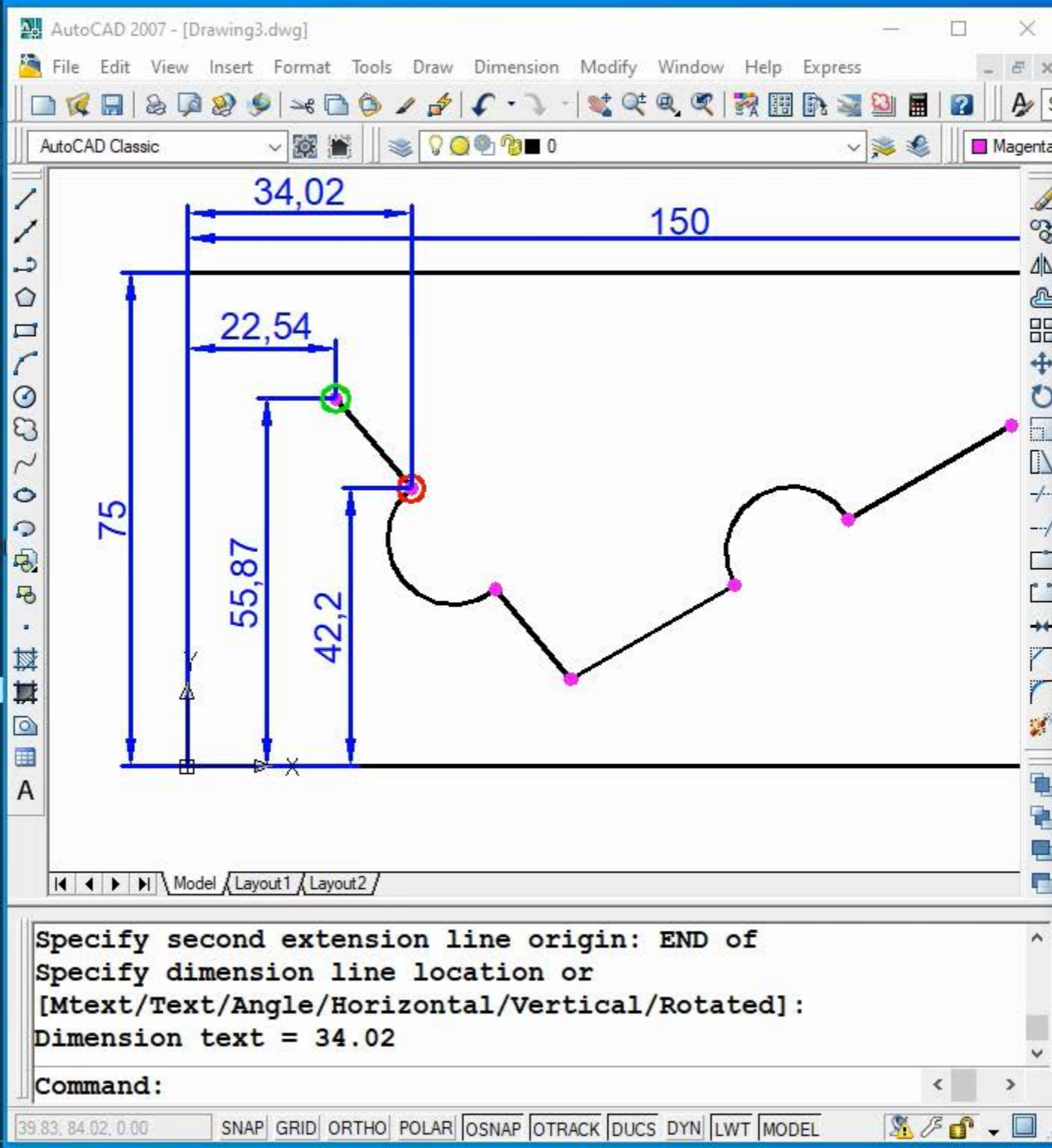
G90 ABSOLUTE PROGRAMLAMA



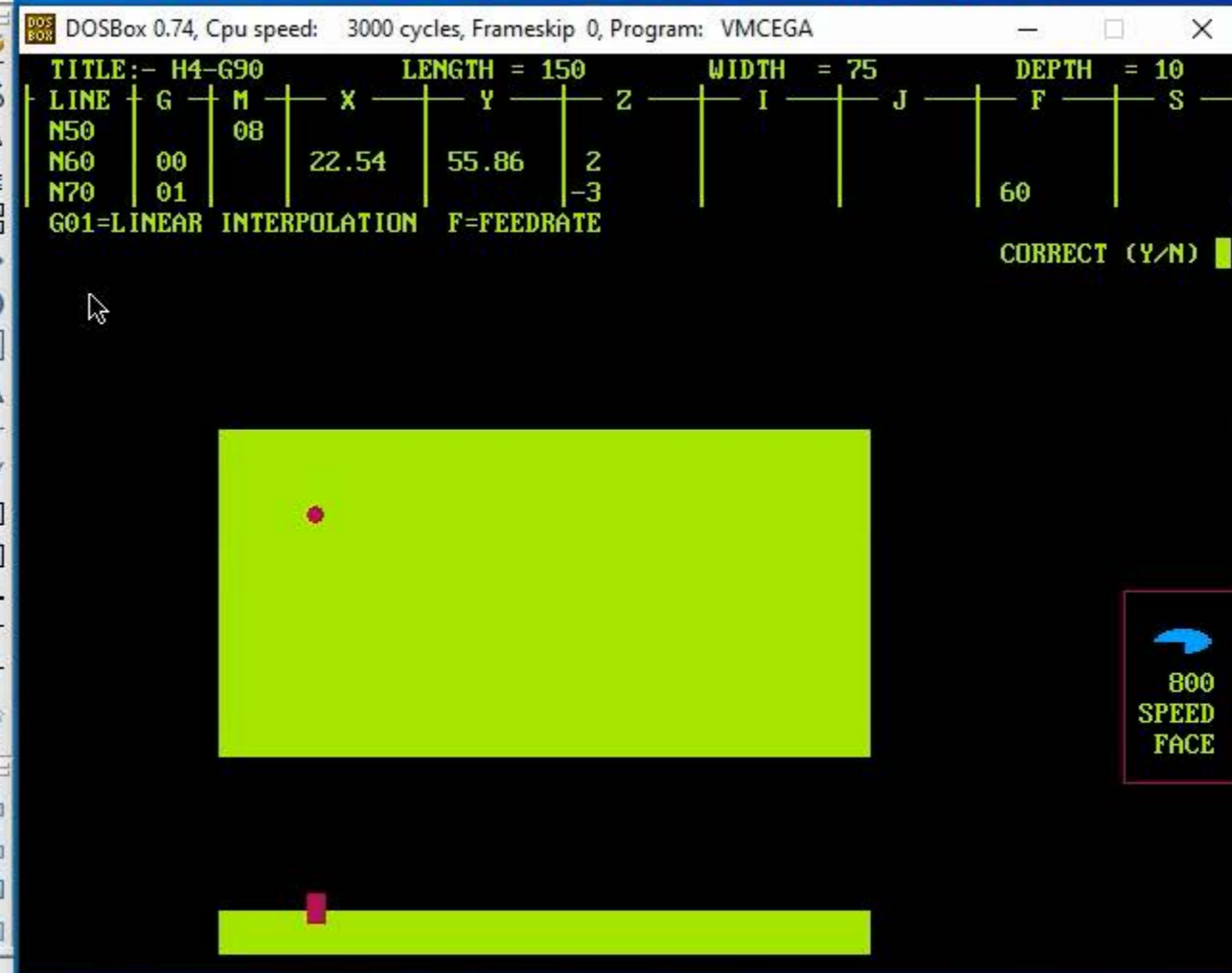


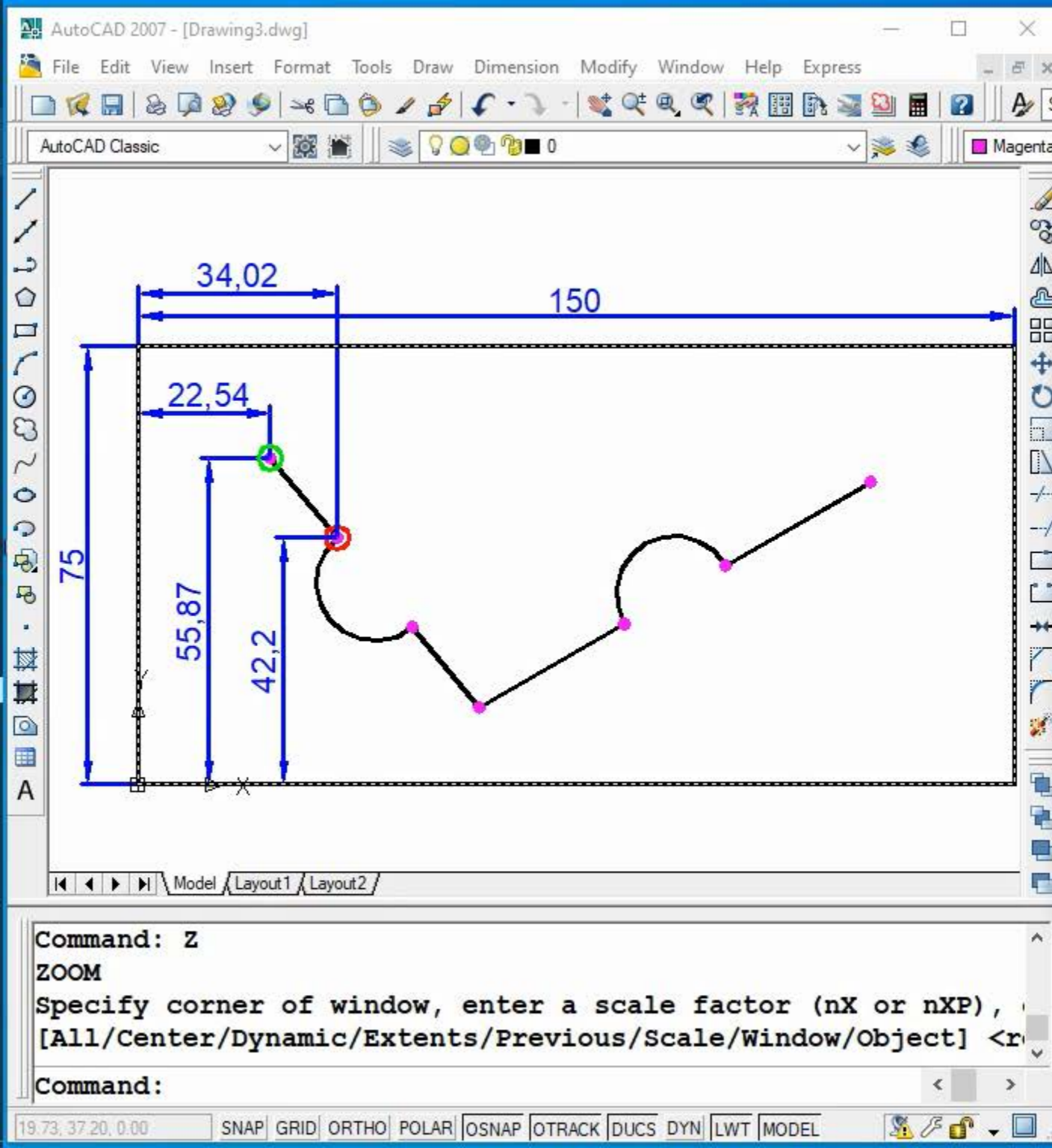
G90 ABSOLUTE PROGRAMLAMA



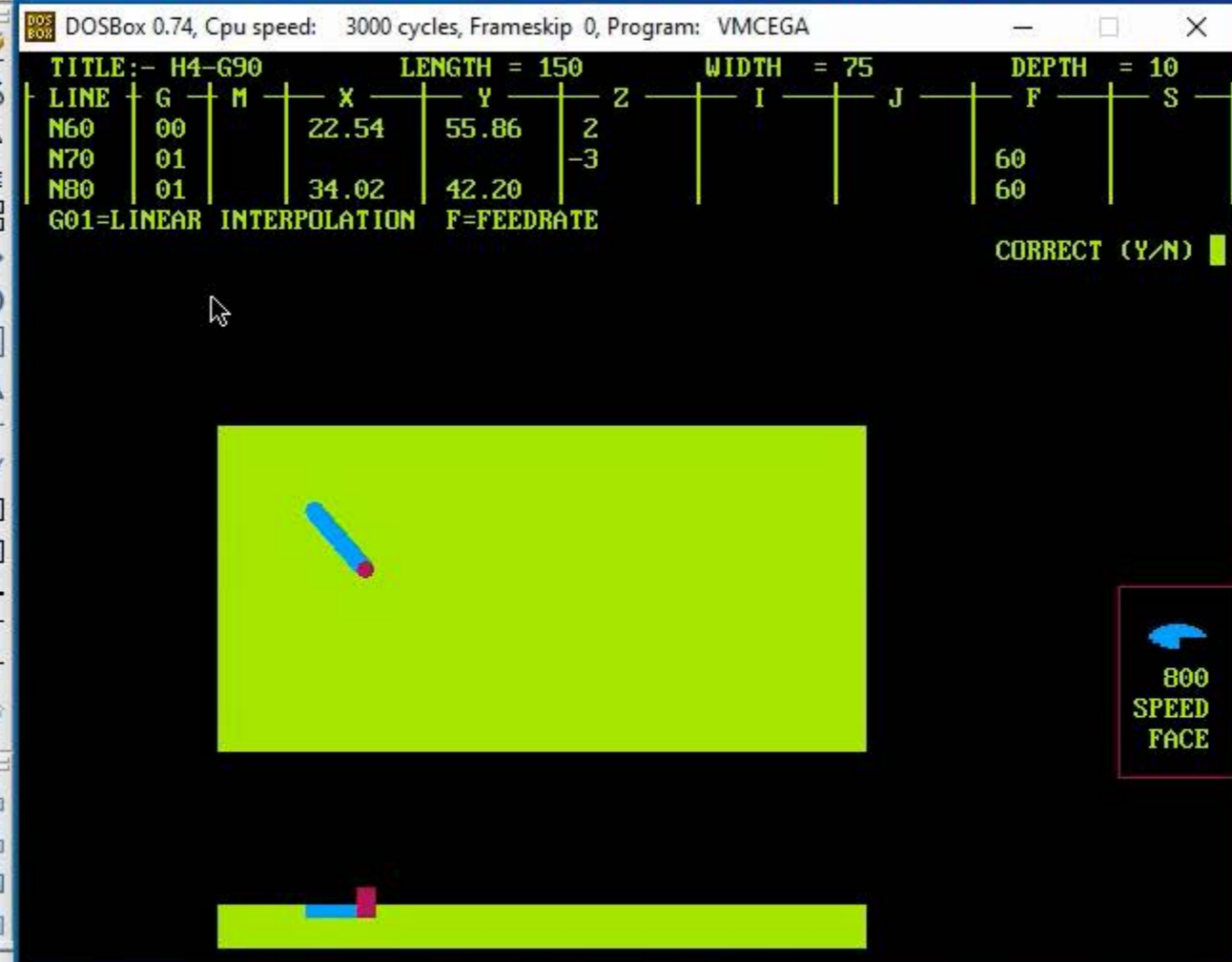


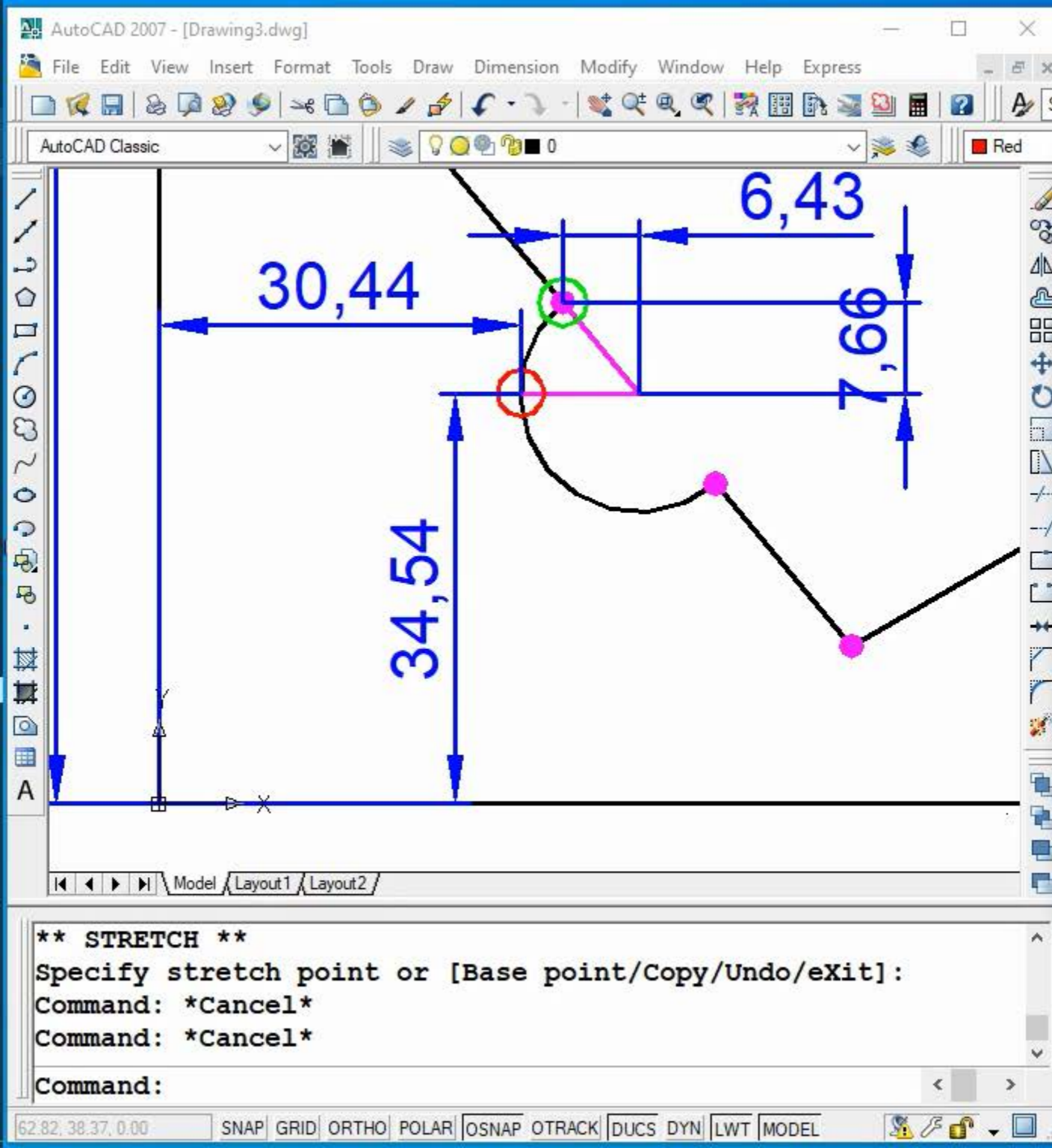
G90 ABSOLUTE PROGRAMLAMA



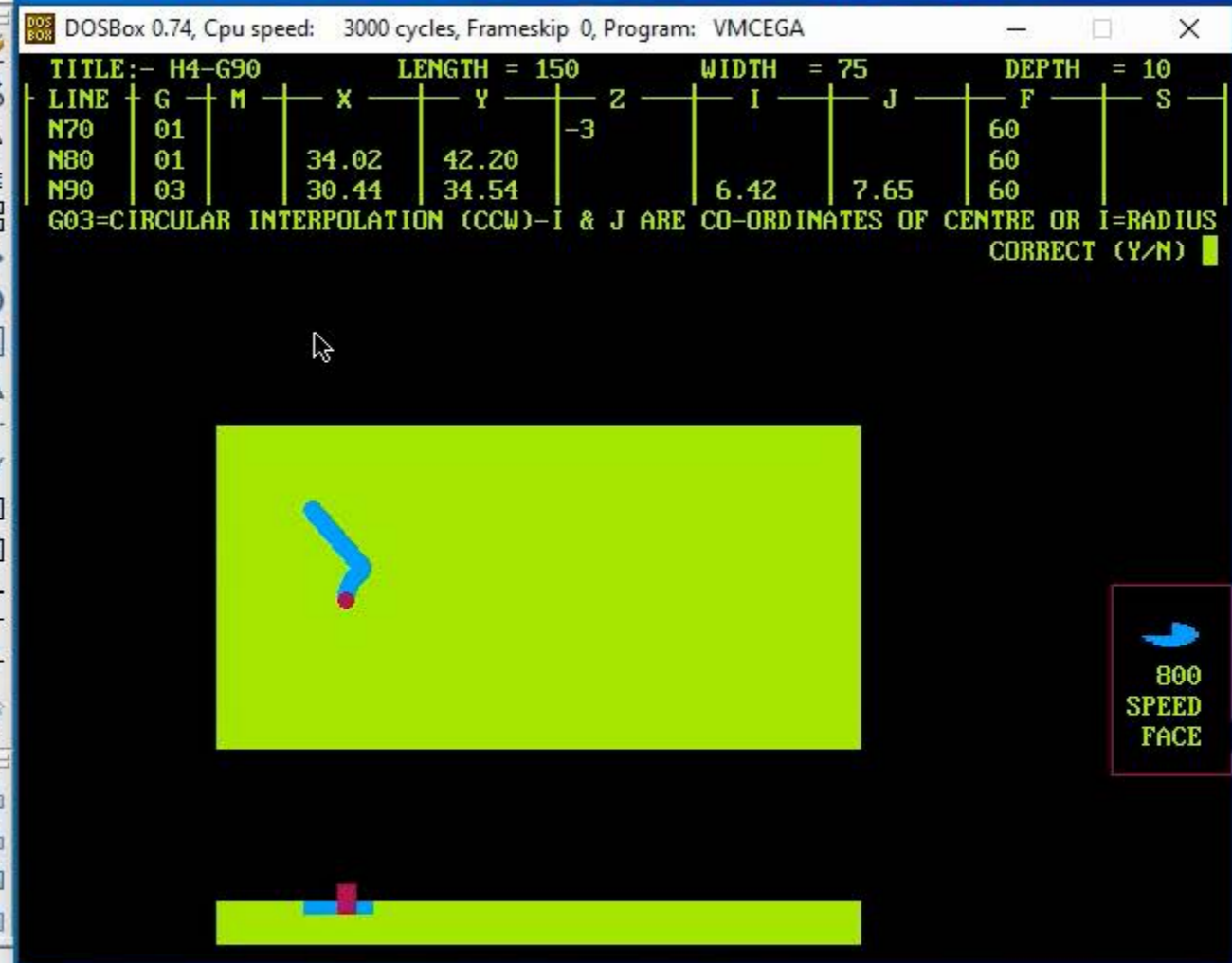


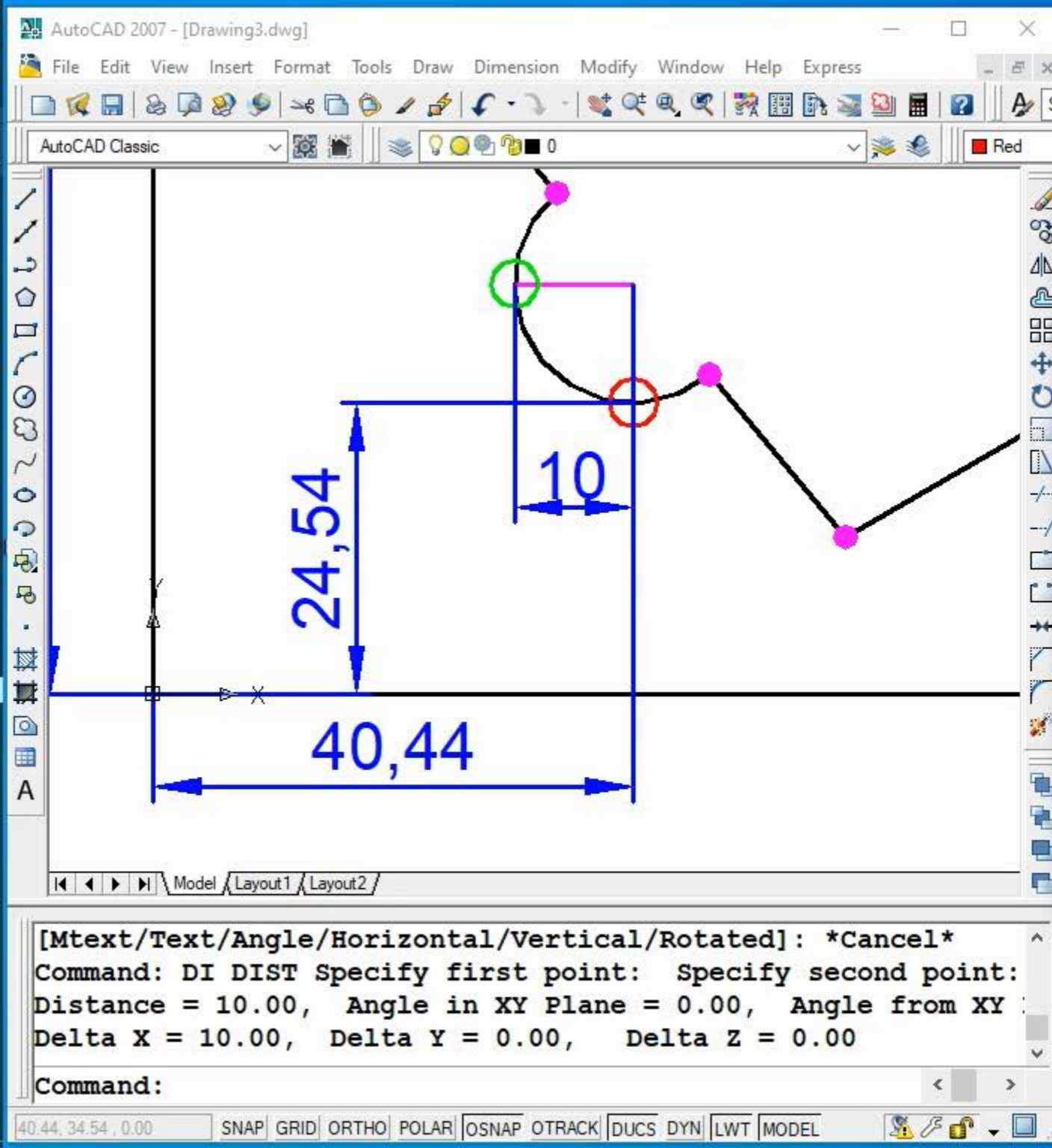
G90 ABSOLUTE PROGRAMLAMA





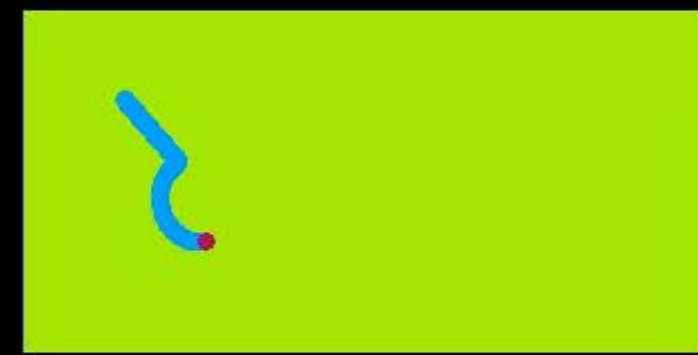
G90 ABSOLUTE PROGRAMLAMA





G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA
TITLE:- H4-G90          LENGTH = 150          WIDTH = 75          DEPTH = 10
LINE | G | M | X | Y | Z | I | J | F | S |
N80  | 01 |   | 34.02 | 42.20 |   |   |   | 60 |   |
N90  | 03 |   | 30.44 | 34.54 |   | 6.42 | 7.65 | 60 |   |
N100 | 03 |   | 40.43 | 24.54 |   | 10 | 0 | 60 |   |
G03=CIRCULAR INTERPOLATION (CCW)-I & J ARE CO-ORDINATES OF CENTRE OR I=RADIUS
CORRECT (Y/N) Y
```



800
SPEED
FACE





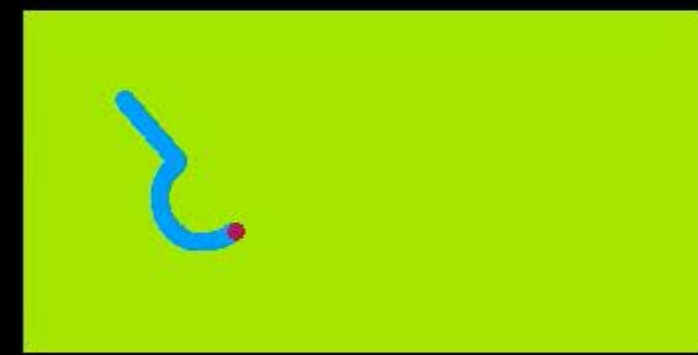
G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

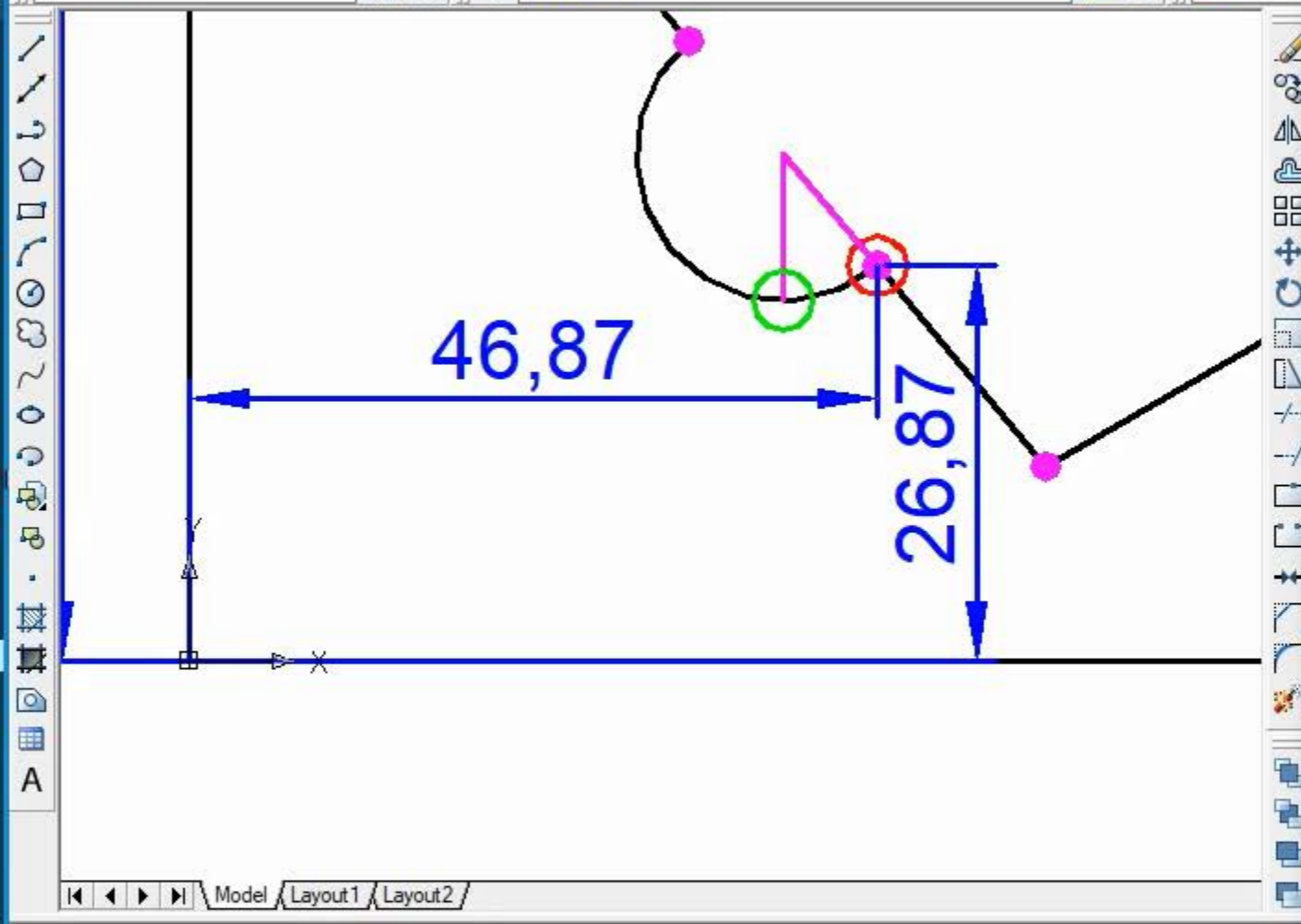
```

TITLE:- H4-G90          LENGTH = 150      WIDTH  = 75      DEPTH  = 10
LINE | G | M | X | Y | Z | I | J | F | S |
N90  | 03 |   | 30.44 | 34.54 |   | 6.42 | 7.65 | 60 |   |
N100 | 03 |   | 40.43 | 24.54 |   | 10   | 0   | 60 |   |
N110 | 03 |   | 46.86 | 26.87 |   | 0   | 10  | 60 |   |
    
```

CORRECT (Y/N) █



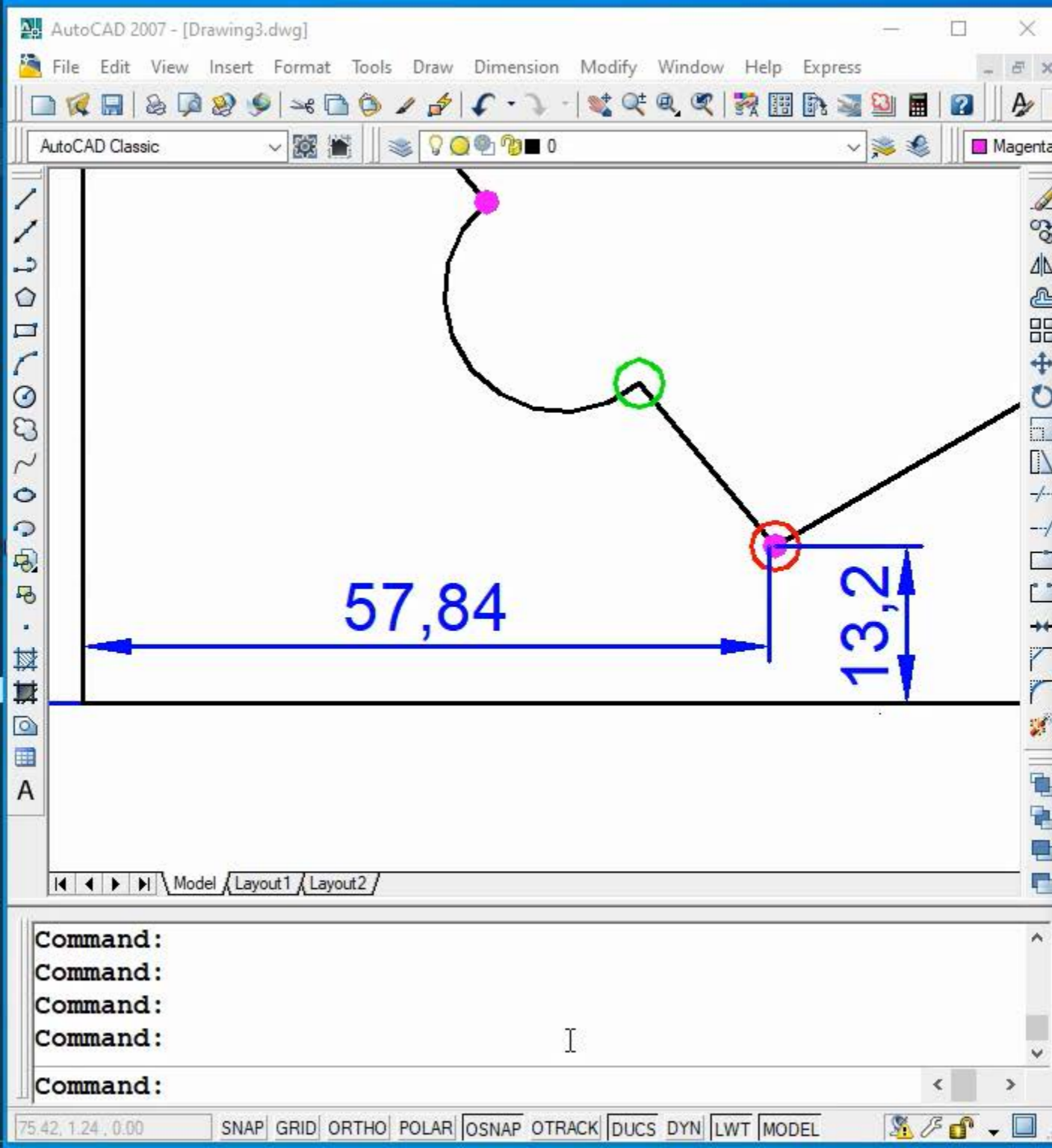
800
SPEED
FACE



```

Delta X = 6.43, Delta Y = 2.84, Delta Z = 0.00
Command: DI DIST Specify first point: Specify second point:
Distance = 10.00, Angle in XY Plane = 90.00, Angle from XY
Delta X = 0.00, Delta Y = 10.00, Delta Z = 0.00

Command:
    
```



G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

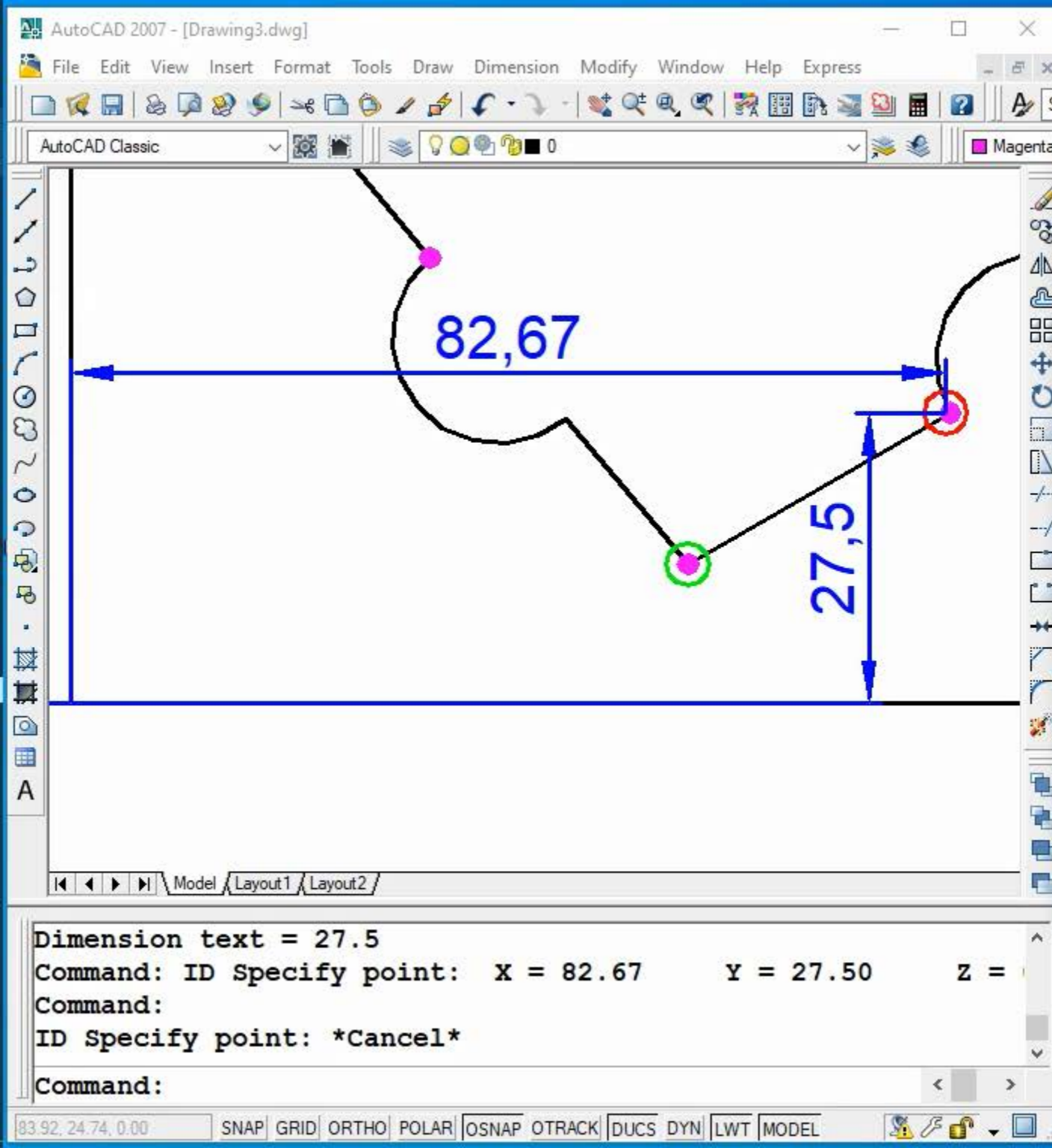
TITLE:- H4-G90 LENGTH = 150 WIDTH = 75 DEPTH = 10

LINE	G	M	X	Y	Z	I	J	F	S
N100	03		40.43	24.54		10	0	60	
N110	03		46.86	26.87		0	10	60	
N120	01		57.84	13.19				60	

G01=LINEAR INTERPOLATION F=FEEDRATE

CORRECT (Y/N) Y

800 SPEED FACE

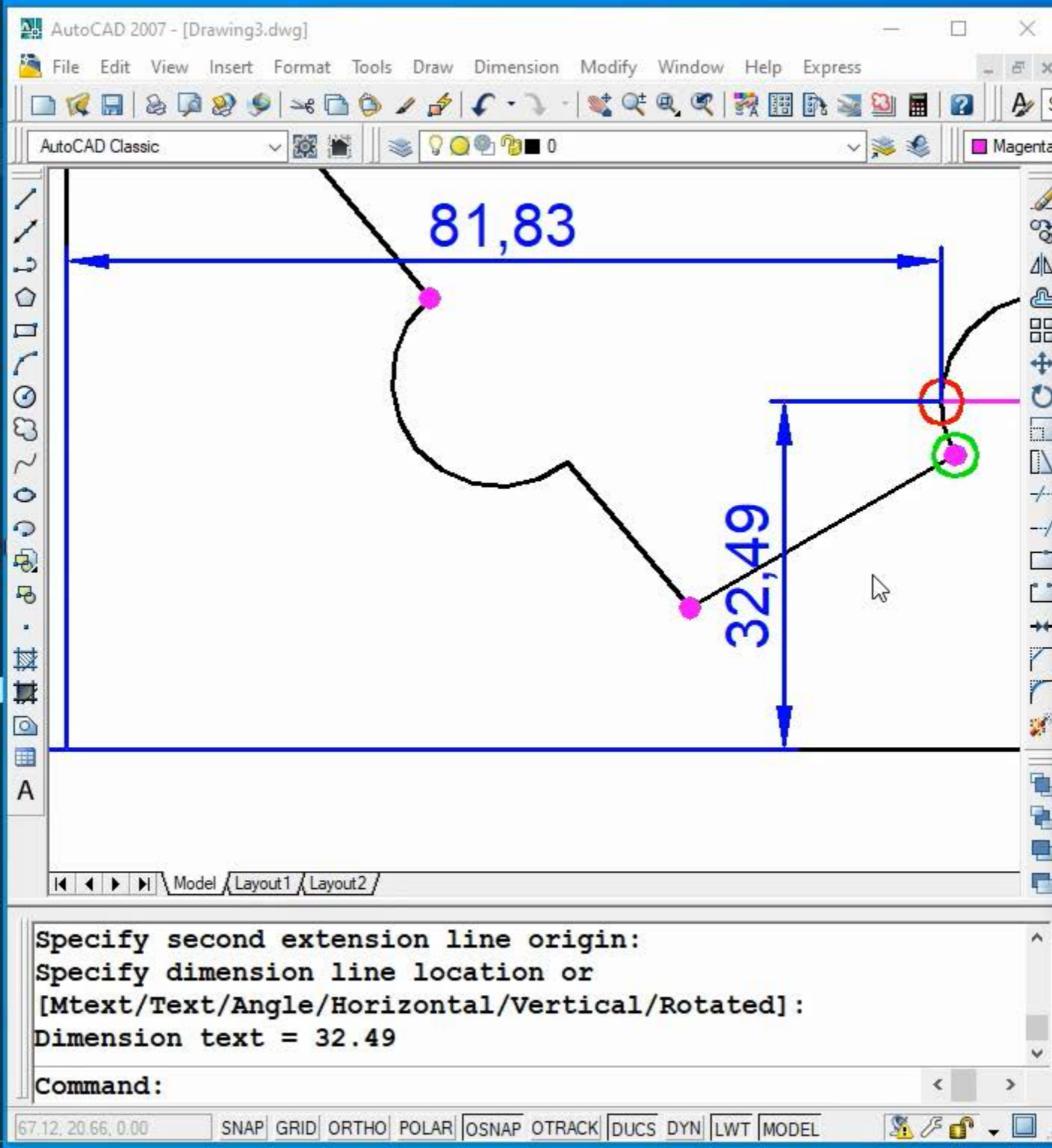


G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```
TITLE:- H4-G90          LENGTH = 150          WIDTH = 75          DEPTH = 10
LINE  G  M  X      Y      Z      I      J      F      S
N110  03          46.86  26.87          0      10      60
N120  01          57.84  13.19
N130  01          82.66  27.50
G01=LINEAR INTERPOLATION F=FEEDRATE
CORRECT (Y/N) Y
```

800
SPEED
FACE



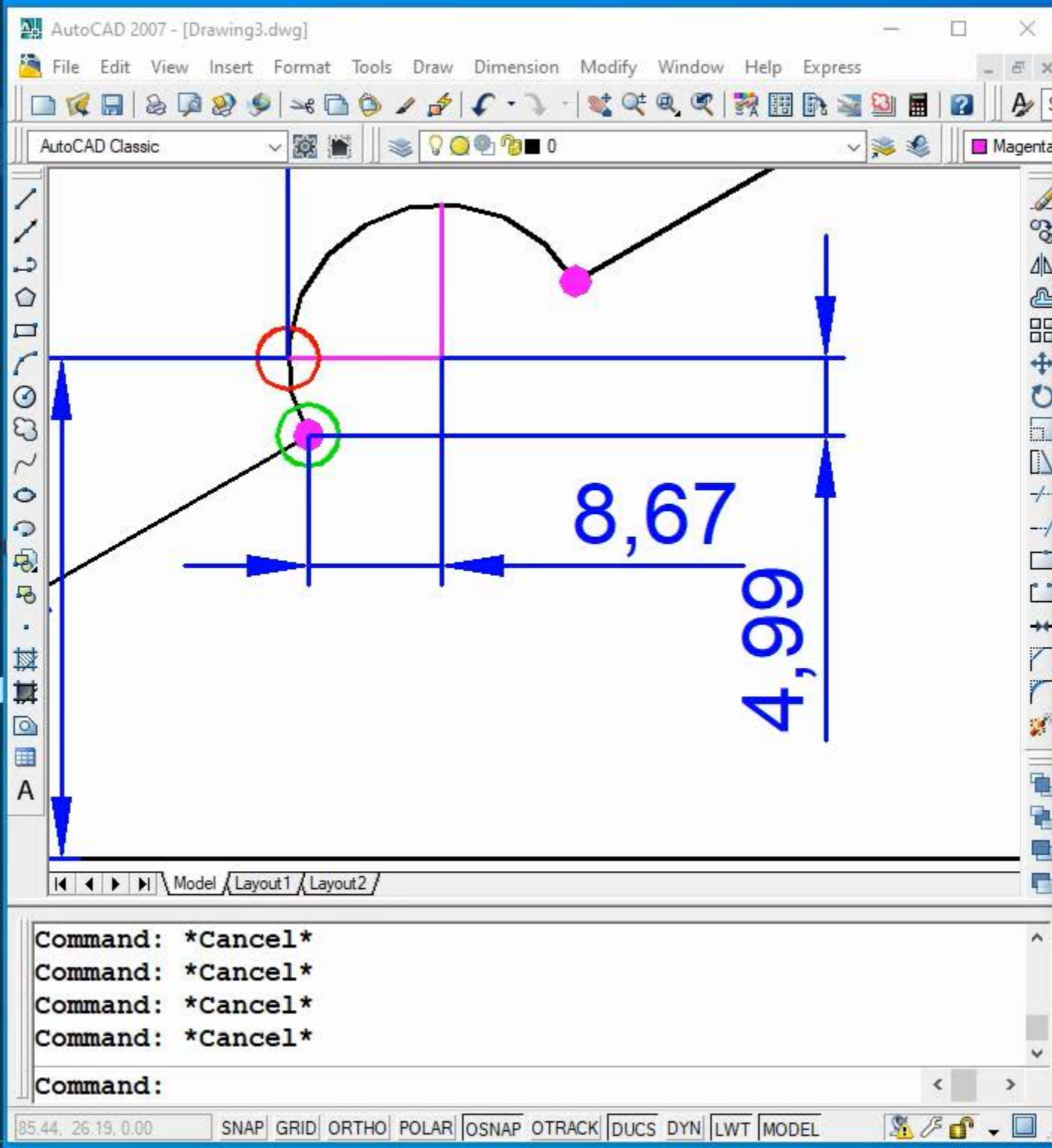
G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```

TITLE:- H4-G90          LENGTH = 150      WIDTH  = 75      DEPTH  = 10
LINE  G  M  X      Y      Z      I      J      F      S
N120 01          57.84  13.19          60
N130 01          82.66  27.50          60
N140  2          81.83  32.49
G02=CIRCULAR INTERPOLATION (CW)-I & J ARE CO-ORDINATES OF CENTRE OR I=RADIUS
  
```

800
SPEED
FACE



G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```

TITLE:- H4-G90          LENGTH = 150      WIDTH = 75      DEPTH = 10
LINE  G  M  X      Y      Z      I      J      F      S
N120  01      57.84  13.19      60
N130  01      82.66  27.50      60
N140  02      81.83  32.49      8.67   4.98   60
G02=CIRCULAR INTERPOLATION (CW)-I & J ARE CO-ORDINATES OF CENTRE OR I=RADIUS
CORRECT (Y/N)

```

800 SPEED FACE



G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

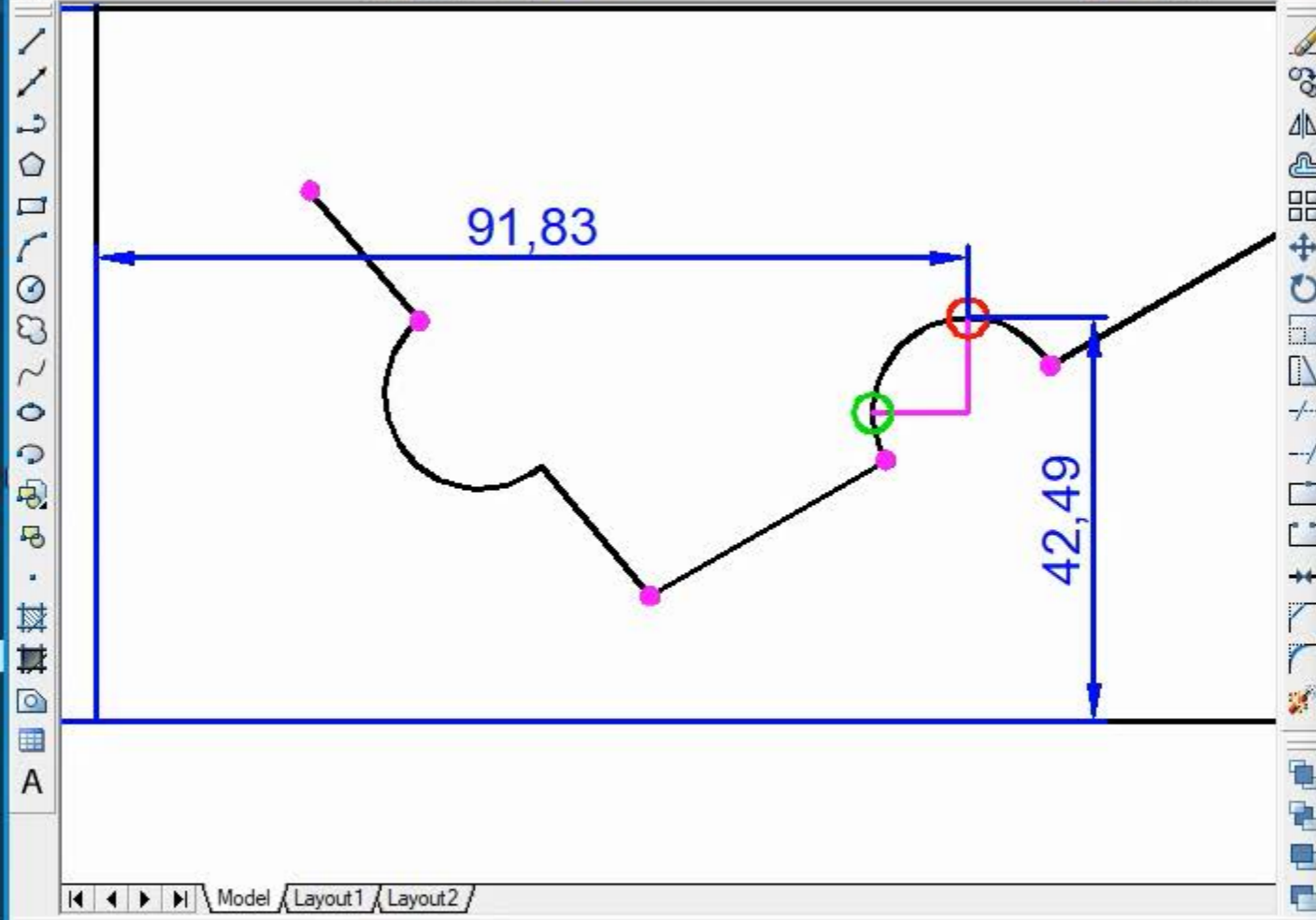
```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA
```

LINE	G	M	X	Y	Z	I	J	F	S
N130	01		82.66	27.50				60	
N140	02		81.83	32.49		8.67	4.98	60	
N150	02		91.83	42.49				60	

G02=CIRCULAR INTERPOLATION (CW)-I & J ARE CO-ORDINATES OF CENTRE OR I=RADIUS

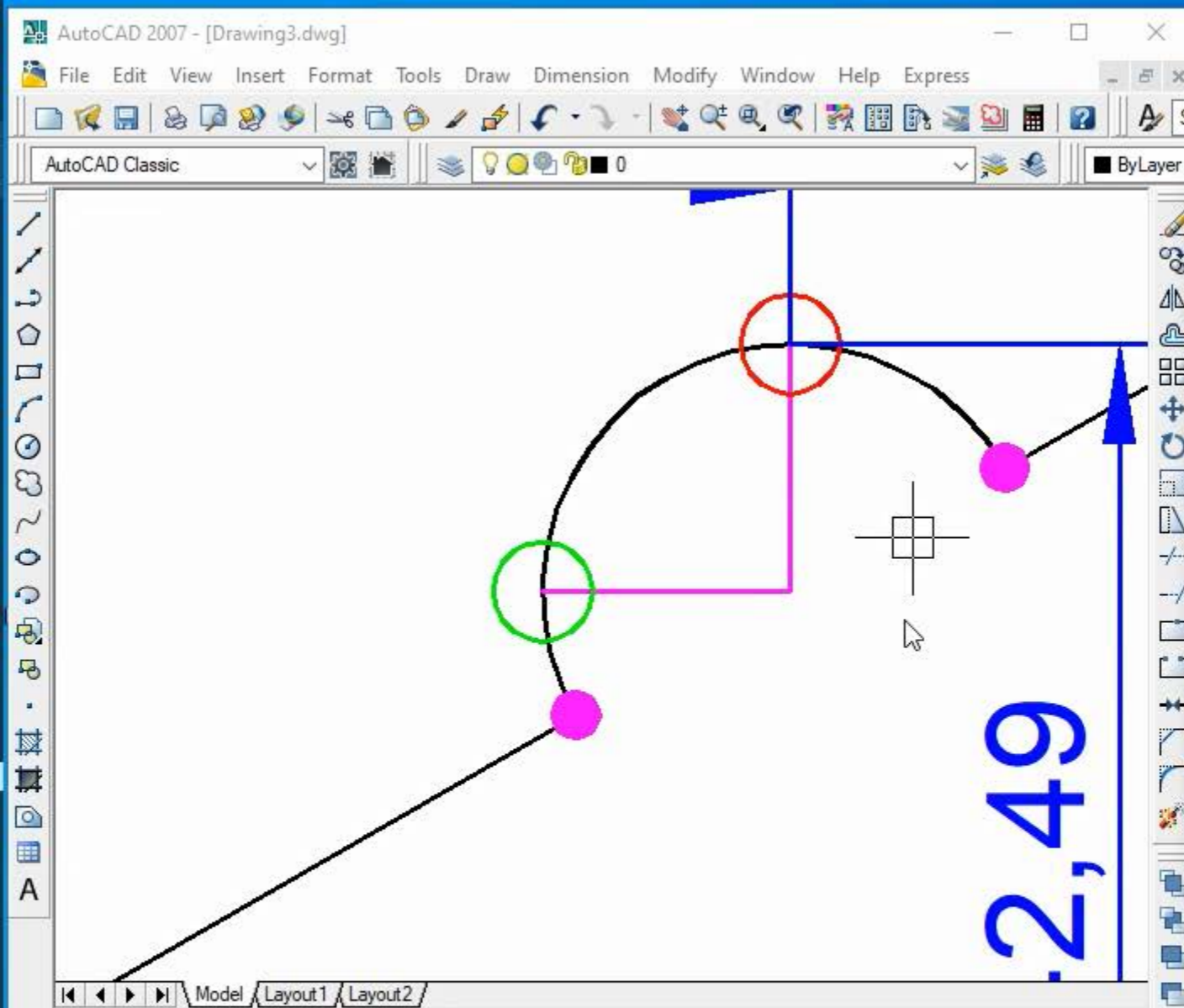


800
SPEED
FACE



```
Command: Z ZOOM
Specify corner of window, enter a scale factor (nX or nXP),
[All/Center/Dynamic/Extents/Previous/Scale/Window/Object] <
Press ESC or ENTER to exit, or right-click to display shortcuts
```

Command:



Command: Z ZOOM
 Specify corner of window, enter a scale factor (nX or nXP),
 [All/Center/Dynamic/Extents/Previous/Scale/Window/Object] <return>
 Press ESC or ENTER to exit, or right-click to display shortcuts
 Command:

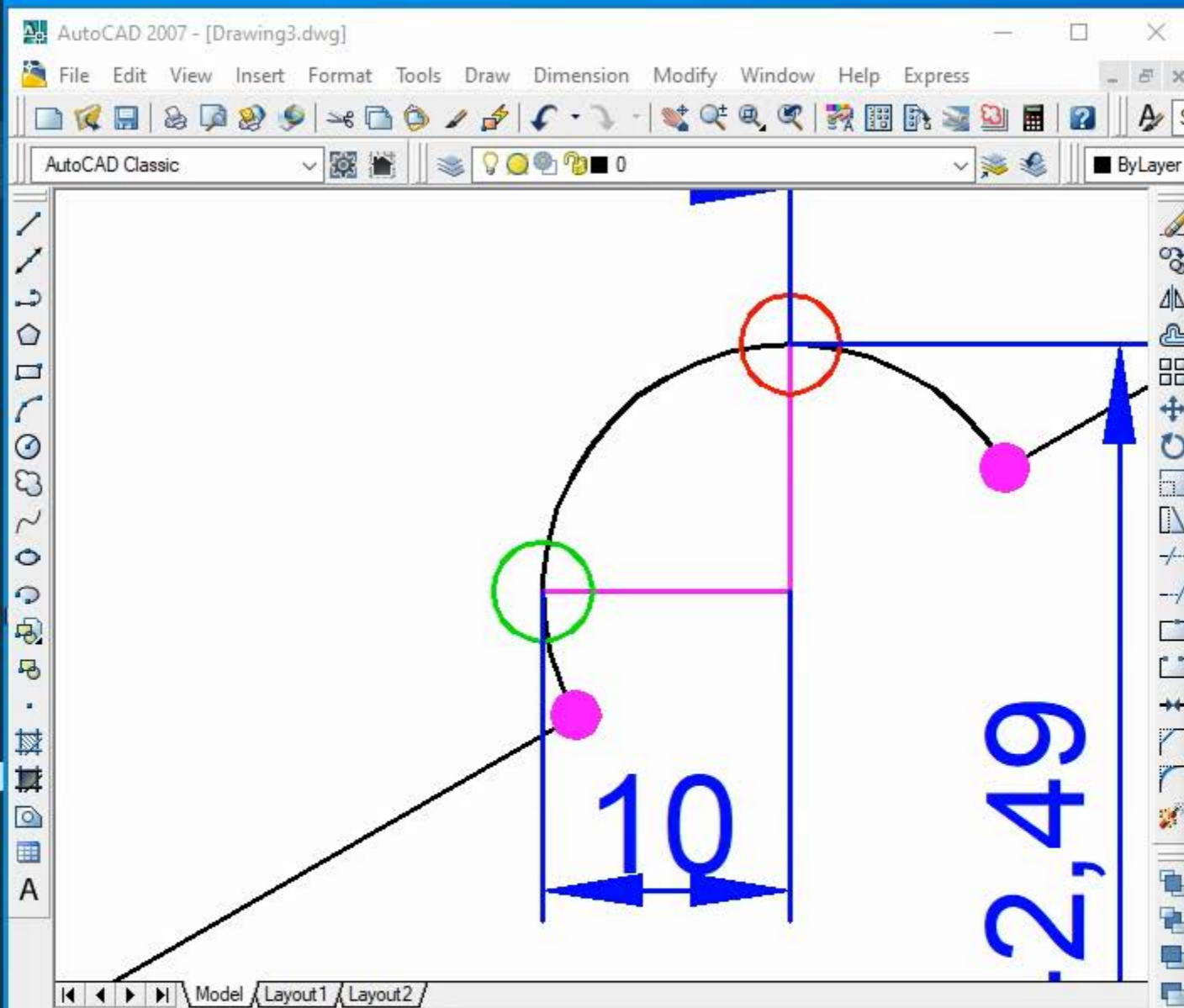
G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADIUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

TITLE:- H4-G90 LENGTH = 150 WIDTH = 75 DEPTH = 10

LINE	G	M	X	Y	Z	I	J	F	S
N10	90								
N20	71								
N30			0	0	10	1	4	1	
N40		03							800
N50		08							
N60	00		22.54	55.86	2				
N70	01				-3			60	
N80	01		34.02	42.20				60	
N90	03		30.44	34.54		6.42	7.65	60	
N100	03		40.43	24.54		10	0	60	
N110	03		46.86	26.87		0	10	60	
N120	01		57.84	13.19				60	
N130	01		82.66	27.50				60	
N140	02		81.83	32.49		8.67	4.98	60	
N150	02		91.83	42.49				60	
N160		99							

PRESS RETURN TO CONTINUE



Dimension text = 10
 Command: DI DIST Specify first point: Specify second point:
 Distance = 10.00, Angle in XY Plane = 0.00, Angle from XY
 Delta X = 10.00, Delta Y = 0.00, Delta Z = 0.00
 Command:

G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADIUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

LINE	G	M	X	Y	Z	I	J	F	S
N130	01		82.66	27.50				60	
N140	02		81.83	32.49		8.67	4.98	60	
N150	02		91.83	42.49		10	0	60	

CORRECT (Y/N) Y



800
 SPEED
 FACE





G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

LINE	G	M	X	Y	Z	I	J	F	S
N140	02		81.83	32.49		8.67	4.98	60	
N150	02		91.83	42.49		10	0	60	
N160	02		100.50	37.47		0	-10	60	

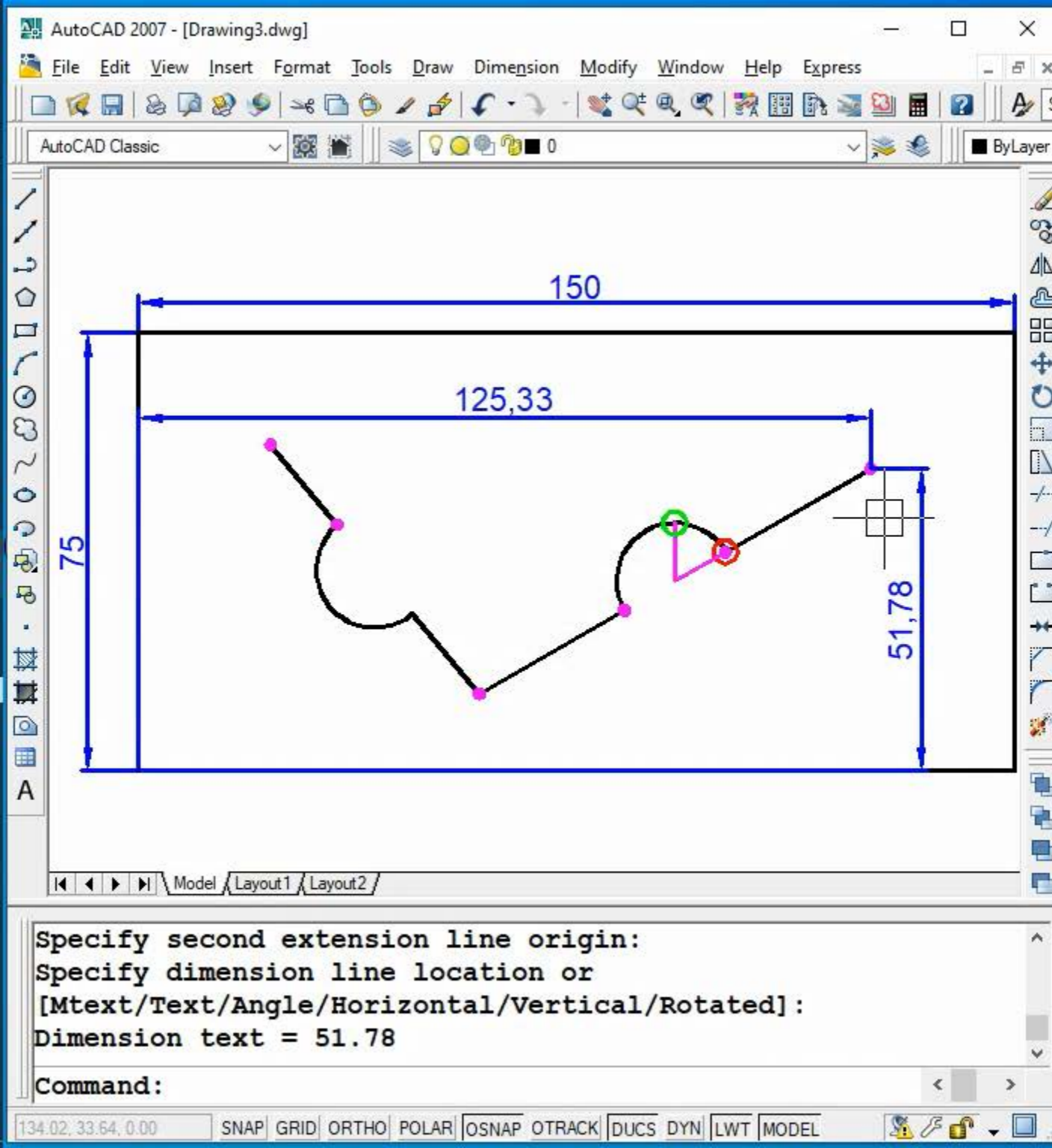
CORRECT (Y/N) █



800
SPEED
FACE

Press ESC or ENTER to exit, or right-click to display shortcuts
 Command: DI DIST Specify first point: Specify second point:
 Distance = 10.00, Angle in XY Plane = 270.00, Angle from X
 Delta X = 0.00, Delta Y = -10.00, Delta Z = 0.00

Command:
 91.83, 32.49, 0.00 SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL



G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```

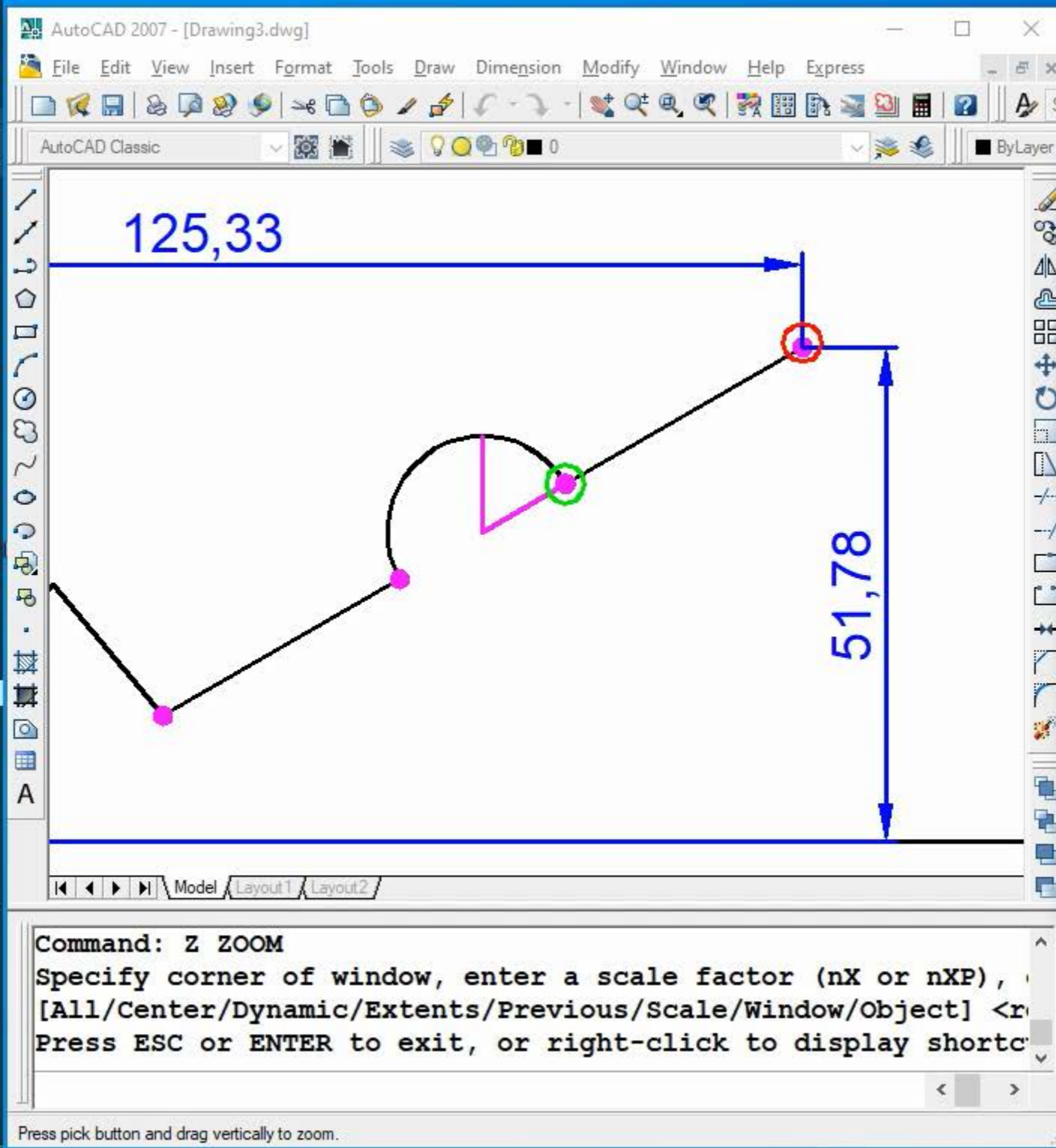
TITLE: - H4-G90
LENGTH = 150
WIDTH = 75
DEPTH = 10

```

LINE	G	M	X	Y	Z	I	J	F	S
N150	02		91.83	42.49		10	0	60	
N160	02		100.50	37.47		0	-10	60	
N170									

G00=RAPID MOVEMENT

800 SPEED FACE

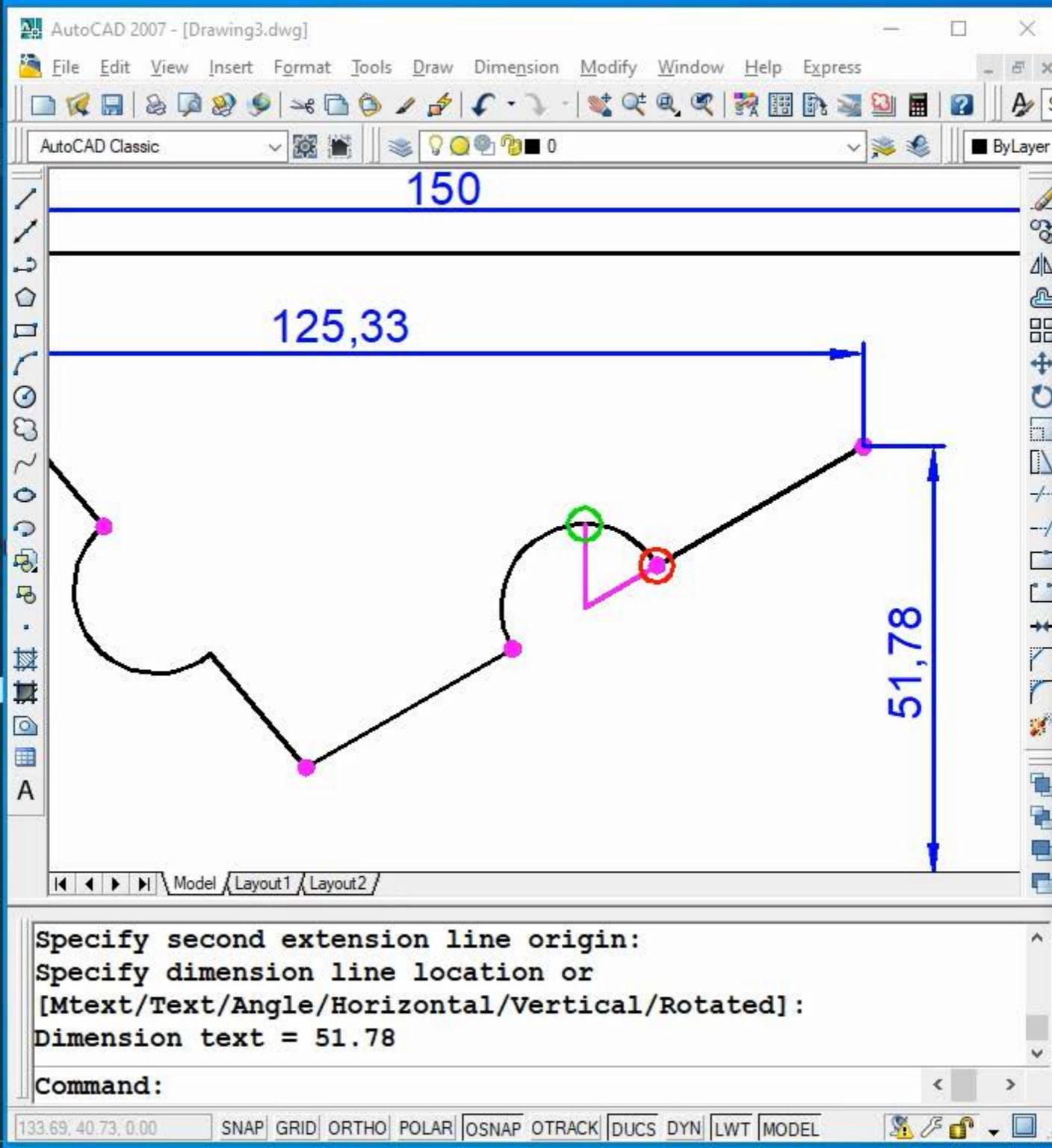


G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```
TITLE:- H4-G90          LENGTH = 150          WIDTH = 75          DEPTH = 10
LINE  G  M  X  Y  Z  I  J  F  S
N150  02          91.83  42.49          10          0          60
N160  02          100.50  37.47          0          -10         60
N170  01          125.33  51.77          0          0          60
G01=LINEAR INTERPOLATION F=FEEDRATE
CORRECT (Y/N) Y
```

800
SPEED
FACE



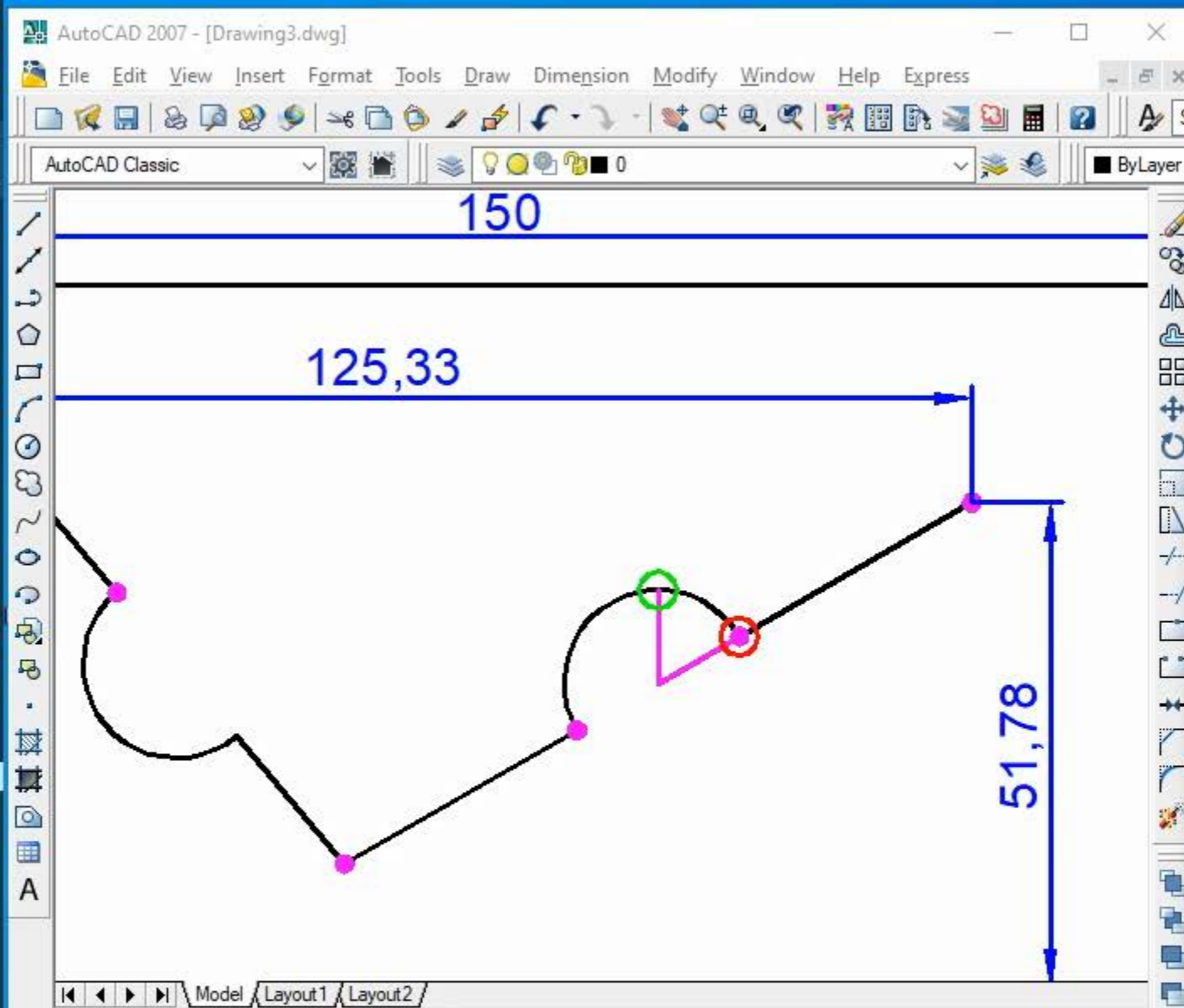
G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADYUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```

TITLE:- H4-G90          LENGTH = 150      WIDTH = 75      DEPTH = 10
LINE  G  M  X  Y  Z  I  J  F  S
N180
N190      09
N200      05
G00=RAPID MOVEMENT
M05=SPINDLE STOP
  
```

800
SPEED
FACE



Specify second extension line origin:
 Specify dimension line location or
 [Mtext/Text/Angle/Horizontal/Vertical/Rotated]:
 Dimension text = 51.78

Command:

G90 ABSOLUTE PROGRAMLAMA I,J ÇAKIYA GÖRE RADIUS MERKEZİNİN UZAKLIĞI

DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: VMCEGA

```

TITLE:- H4-G90          LENGTH = 150      WIDTH  = 75      DEPTH  = 10
LINE  G  M  X  Y  Z  I  J  F  S
N190   09
N200   05
N210   30
G00=RAPID MOVEMENT
M30=END OF PROGRAM (REPEAT)                CORRECT (Y/N) Y
  
```

Uygulamanın video çekimine ařađıdaki adresten ulařılabilir

YOUTUBE –TELAT TÜRKYILMAZ

OYNATMA LİSTELERİ

Video desteđi ile uygulama yapmanızı tavsiye ederim

İYİ ÇALIŐMALAR DİLERİM