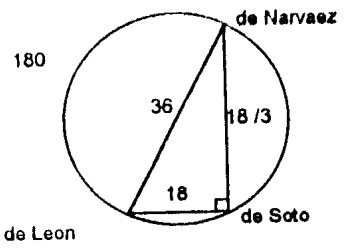
01.) Plant: 181/40 = 4.525 hours; 4.525 hours + 1 hour = 5.525 total trip time
Flagler: 330/40 = 8.25 hours total trip time

Plant: 0900a + 5.525 hour trip time >> arrives at 14:31:30 (02:31p)
Flagler: 14:31:30 – 8.25 hour trip time >> must depart by 06:16:30 (06:16a)

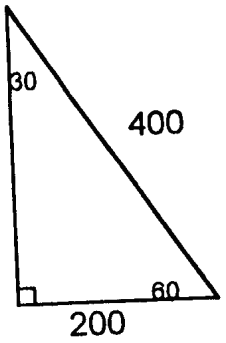
ANSWER: A

02.)



ANSWER: D

06.)



ANSWER: C

03.) area of original circle: 81π
area of removed ring: $(2^2)\pi - (1^2)\pi = 3\pi$
new area: $81\pi - 3\pi = 78\pi$

ANSWER: B

04.) $91 * 4 = 364$
$364 = 98.55+86.55+97.25+x$
$x = 82.05$

ANSWER: E

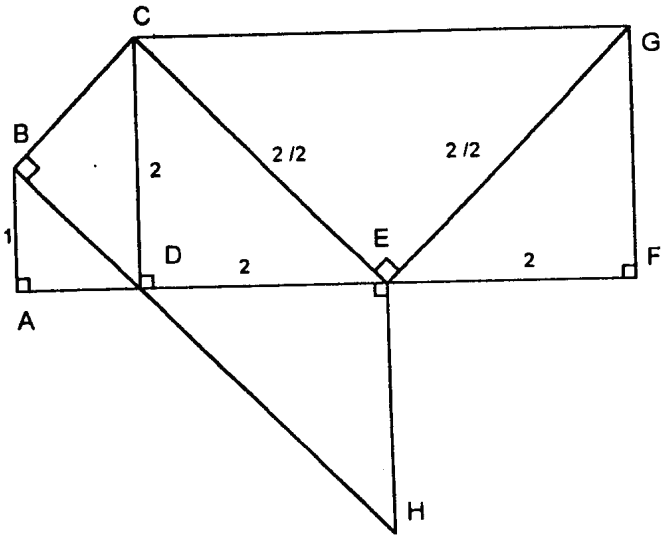
05.) solve for $h(t) = 0$, $t = 0.553001$ seconds (negative time irrelevant)
distance = rate * time
distance = 1000 km/hr * (1/3600 hr/sec) * 0.553001 sec = 0.153611 km
distance = 0.15361 km = 153.6 m

ANSWER: B

07.) **$v = iR >>> i = v/R$**
$5/(25 \times 10E3) - 5/(100 \times 10E3) = 1.5 \times 10\ E{-}4$

ANSWER: C

08.)



ANSWER: D

09.) distance formula to find side of square: $\sqrt{([3-(-1)]^2 + [7-10]^2)} = 5$
diagonal of square: side * $\sqrt{2}$ = $5\sqrt{2}$

ANSWER: E

10.) volume = number of drips * (volume of drip) = 55 * (1/60) = 55/60 = 11/12 mL
rate = volume / time = [(11/12) / 50 sec] * [60 sec/min] = 11/10 mL/min

ANSWER: A

11.) $P = 4R$, $P = 0.5M$
$(0.25P)(2P)(P) = 864$
$P = 12$
$M = 24$, nearest larger prime number: 29

ANSWER: D

12.) shorter side is half of larger side, therefore short side is 20m
2*40m + 2*20m = 120m

ANSWER: C

13.) use Heron's Formula
$A = \sqrt{s(s-a)(s-b)(s-c)}$
Area(B757) = $\sqrt{1893.5(1893.5-1513)(1893.5-1464)(1893.5-810)}$ = 57903.66 square miles
Area(B777) = $\sqrt{1960.5(1960.5-403)(1960.5-1589)(1960.5-1929)}$ = 18903.06 square miles

ANSWER: B

14.) Area = $(0.85x)^2 = 0.7225x^2$
Percentage change = 1 – 0.7225 = 0.2775 = 27.75%

ANSWER: B

15.) 09:50p in Tampa is 0350a (next day) in Berlin [+1 – (-5)) = 6 hours difference]
departs Berlin at 1155a (Berlin time) and arrives 0350a [next day] (Berlin time)
total travel time: 15 hr 55 min

ANSWER: A

16.) 4 * (6 m * 10 m) = 240 m^2
10 m * 10 m = 100 m^2
Area to be tiled: 240 + 100 = 340 m^2
Tile area: 100 cm^2 = 0.01 m^2
Number of tile = cover area / tile area = 340/.01 = 34000

ANSWER: E

17.) $5\pi(80\text{rpm}) = r\pi(100\text{rpm})$
r = 4 cm

ANSWER: D

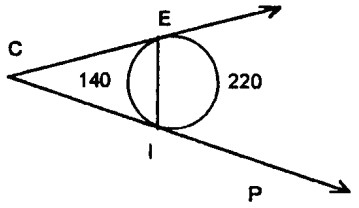
18.) $\frac{1}{2}x^3 = \frac{125}{54}$
x 5/3

ANSWER: E

19.) $(x+1)^2 + x^2 = 13$
(x-2)(x+3) = 0
smaller square side = 2 mi
larger square side = 3 mi
larger square area = 9 sq mi

ANSWER: D

20.) angle EIP is ½(major arc EI) = 110



ANSWER: C

21.) AQ = AT
3x+4 = 5x-2
x = 3
substitute x =3 for all x values in problem
AQ = AT = 13; QB = BR = 12; RC = CS = 6; DS = DT = 7
Perimeter = 2(13) + 2(12) + 2(6) + 2(7) = 76

ANSWER: A

22.) Bill: 45, 45, 90 right triangle
Paul: 30, 60, 90 right triangle
Ratio of smallest angles: 45:30 = 3:2

ANSWER: A

23.) (CB)(AC) = (CD)(CE)
7(10) = CD(12)
CD = 35/6
DE = CE – CD = 37/6

ANSWER: C

24.) volume of box = 70(10)(9) = 6300
volume of sphere = $(4/3)(\pi)r^3 = (1372\pi)/3$
new volume = volume of box – volume of sphere = $6300 - (1372\pi)/3$

ANSWER: B

25.) 0700a: 14 degrees
trip duration: 2 hr
temperature at 0900a: 14 + 1.5(2) = 17 degrees

ANSWER: E

26.) distance formula
Maria: $\sqrt{10^2 + 3^2} = \sqrt{109}$
Isai: $\sqrt{7^2 + 8^2} = \sqrt{113}$

ANSWER: B

27.) 99% of 10000 = 9900
volume after day 1 = (.98)(10000) = 9800
volume after day 2 = (.98)(9800) = 9604
water needed: 9900 – 9604 = 296 m^2

ANSWER: A

28.) 450 km/(120 km/hr) = 3.75 hr
4 – 3.75 hr = 0.25 hr = 15 min

ANSWER: D

29.) roots of equation $x^2 - 169 = 0$ are –13 and 13
difference between roots: 13 – (-13) = 26
first two digit prime number: 11
product: 26(11) = 286

ANSWER: C

30.) Entry1: 5=E
Entry2: 14=N
Entry3: 4=D
Entry4: 5=E
Entry5: 24=X
Entry6: 1=A
Entry7: 13=M
Entry Code: ENDEXAM

ANSWER: A