(1) What do x and y equal given the equations:

$6x + 15y = 69$ $\quad 8x - 6y = 14$

A) $x = 3, y = 4$
B) $x = 4, y = 3$
C) $x = 3, y = -4$
D) $x = -3, y = -4$

(2) What is the result of $2x^3 - 3x^2 + 7x - 3$ divided by $2x - 1$?

A) $x^2 - x - 3$
B) $2x^2 + x + 3$
C) $x^2 - x + 3$
D) $x^2 + 4x - 3$

(3) . What is the value of x if $x^{3/2} = 27$?

A) 3
B) 9

(4) Divide $2x^3 + x^2 - 7x + 3$ by $2x - 1$

A) $-x^2 - x + 3$
B) $x^2 - x + 3$
C) $x^2 + x - 3$
D) $x^2 - x + 3$

(5) A water line must be laid 1000' long. One quarter of the line must be made of one inch diameter pipe. The remainder must be of one half inch diameter pipe. One inch pipe costs 36¢ per foot, and half inch pipe costs 24¢ per foot. What is most nearly the cost of the pipe for the job?

a) \$360 b) \$240 c) \$270 d) \$600

(6) If two trucks begin 60 miles apart and head towards each other, one at 45 mph and the other at 30 mph, how much time will it take before they meet?

a) 60 min. b) 48 min. c) 30 min. d) 45 min.

(7) A chimney casts a shadow of 39'. Placing a 6' ruler perpendicular to the ground it casts a shadow of 2'. What is the height of the chimney?

A) 117 B) 10.7 C) 925 D) 14.14

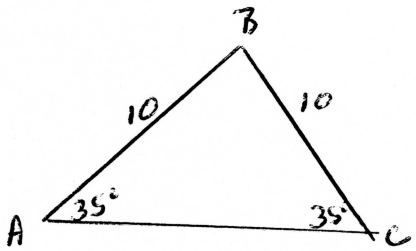
(8) Given triangle ABC, with sides AB & BC both equalling 10', find the area.

A) $\frac{1}{2}$ 10 (Cos. 35 x Sin. 35)

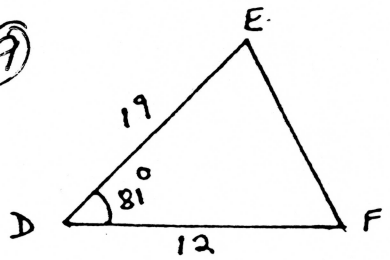
B) $(10)^2$ x (Cos. 35 x Sin. 35)

C) $\sqrt{10}$ x (Cos. 35 x Sin. 35)

D) 10 x (Cos. 35 x Sin. 35)



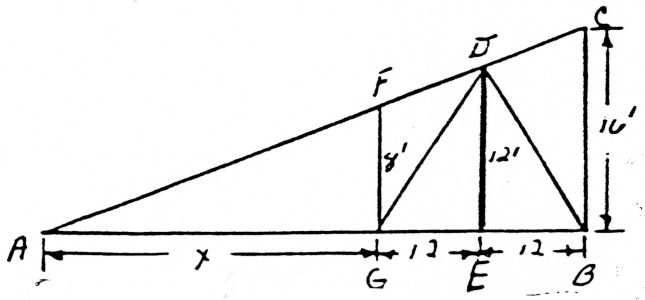
(9)



What is the area of triangle DEF?

A) 6 x 19 cos 9°
B) 6 x 19 sine 9°
C) 12 x 19 cos 9°
D) 12 x 19 sine 9°

(10)



Based on the drawing at the left, what is the distance from A to E?

a) 12' b) 24' c) 36' d) 48'

(11) Given the perimeter of a rectangle is 28' and the area is 48', what is the longest side?

A) 6 B) 8 C) 12 D) 14

(12) Given a circle with r= 360' and an arc of 314.6, what is the angle that subtends the arc?

A) 5° B) 50° C) 150° D) 55°

(13) In a distance of 1000', the angular error was 0°-10'. What is the total linear error?

A) 0.7
B) 1.5
C) 2.9
D) 5.6

(14) If a 6-foot deep trench has a top width of 22 feet and a bottom width of 10 feet, what is the slope of the sides of the trench?

A) 0.5 to 1.0
B) 1.0 to 1.0
C) 1.0 to 2.0
D) 1.0 to 4.0

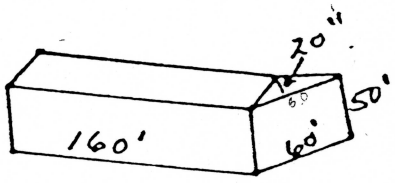
(15) If an equilateral triangle has sides of 20', what is the area?

A) $\frac{20 \times 20 \sqrt{3}}{4}$
B) $20 \times 20 \sqrt{3}$
C) $\frac{20 \times 20 \sqrt{3}}{20}$
D) $\frac{20 \times 20}{4}$

(16) A rectangle whose length equals twice its width has an area of 200 square inches. A triangle whose area is 200 square inches has a height equal to the width of the rectangle What is the length of the base of the triangle?

A) 15'
B) 20'
C) 25'
D) 40'

(17)



The number of square feet of material needed to cover the roof of this building is most nearly?

A) 8,500
B) 9,500
C) 11,500
D) 12,500

1.) $6x + 15y = 69$

$8x - 6y = 14$

Simultaneous Eq.

$8(6x + 15y = 69)$

$6(8x - 6y = 14)$

$\Rightarrow$ $48x + 120y = 552$

$48x - 36y = 84$

$156y = 468$

$y = 3$

Subst.

$6x + 15(3) = 69$

$6x + 45 = 69$

$6x = 24$

$x = 4$

$\boxed{\begin{array}{l} x = 4 \\ y = 3 \end{array}}$ ans

2.)

$$\begin{array}{r|l} & \boxed{x^2 - x + 3} \text{ ans} \\ 2x - 1 & 2x^3 - 3x^2 + 7x - 3 \\ & 2x^3 - x^2 \\ \hline & -2x^2 + 7x - 3 \\ & -2x^2 + x \\ \hline & 6x - 3 \\ & 6x - 3 \\ \hline & 0 \end{array}$$

3

$x^{3/2} = 27$

$(x^{3/2})^2 = (27)^2$

$x^3 = 27^2$

$x^3 = 729$

$x = 9$

4

$$2x-1 \;\overline{)\; 2x^3+x^2-7x+3}$$

x^2+x-3

$2x^3 - x^2$

$2x^2-7x+3$

$2x^2-x$

$-6x+3$

$-6x+3$

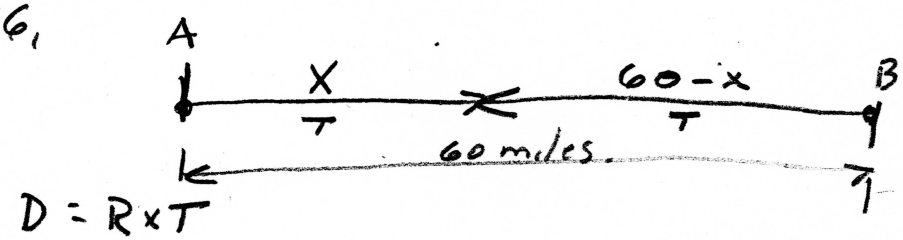
0

5.

$$\frac{1000}{4}(.36) + \left(1000 - \frac{1000}{4}\right)(.24) = x$$

$\$90 + 180 = \$270$

6.



$D = R \times T$

$T = \frac{D}{R}$

$\frac{D_1}{R_1} = \frac{D_2}{R_2}$

Distance / Rate

$\frac{X}{45\text{mph}} = \frac{60-X}{30\text{mph}}$

$30x = 2700 - 45x$

$75x = 2700$

$x = 36$ miles

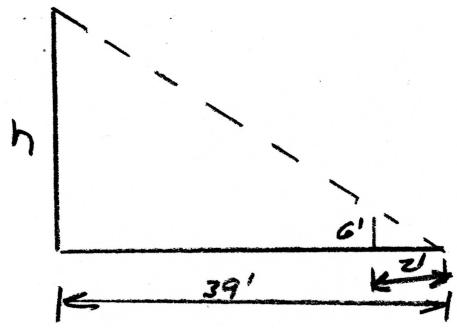
Subs.

$36_m = 45\text{mph} \cdot T$

$.80\text{hrs} = T$

$T = 48\text{min.}$

7.

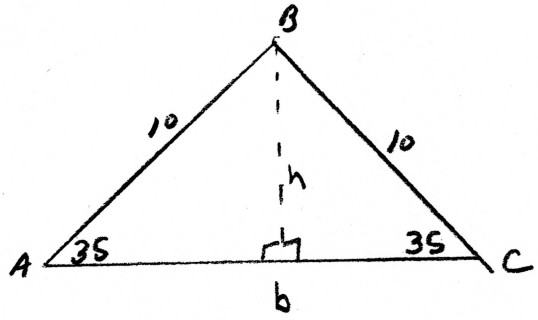


Similar Δ's

$$\frac{h}{39} \quad \frac{6}{2}$$

$$h = 117'$$

8.



$A = \frac{1}{2}bh$

find $h = \sin 35^\circ = \frac{h}{10}$

$h = 10 \sin 35^\circ$

Find b $\quad \cos 35^\circ = \frac{b/2}{10}$

$10 \cos 35^\circ = b/2$

$20 \cos 35^\circ = b$

So $A = \frac{1}{2} b \cdot h$

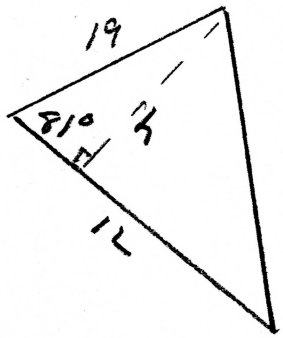
$= \frac{1}{2} 10 \sin 35^\circ \; 20 \cos 35^\circ$

$= 5 \sin 35^\circ \; 20 \cos 35^\circ$

$= 100 \sin 35^\circ \cos 35^\circ$

$= 10^2 \sin 35^\circ \cos 35^\circ$

9



$A = \frac{1}{2} b \cdot h$

$A = \frac{1}{2}(12)(19 \sin 81°)$

$A = 112.6 = \boxed{6 \times 19 \sin 81°}$

$h =$

$\sin 81° = \frac{h}{19}$

$h = 19 \sin 81°$

10

Similar Δs

$$\frac{x+24}{16} = \frac{x+12}{12}$$

x-mult

$$12x + 288 = 16x + 192$$

$$96 = 4x$$

$$x = 24$$

$$\overline{AE} = 24 + 12$$

$$\overline{AE} = 36$$

11 $2L+2W = 28 \Rightarrow L+W = 14$

$L \times W = 48$ $\qquad W = 14 - L$

$L = \frac{48}{W}$ $\qquad \frac{48}{W} + W = 14$

Sub, $L \times (14-L) = 48$

$14L - L^2 = 48$

$L^2 - 14L + 48 = 0$

$(L-6)(L-8) \Rightarrow L = 6$ or $L = 8$

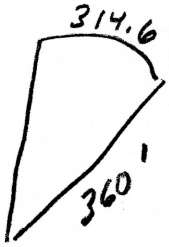
LET $L = 6$ & Sub. $L+W = 14$

$6+W = 14$

$W = 8$

$\Rightarrow$ Longest Side is 8

12



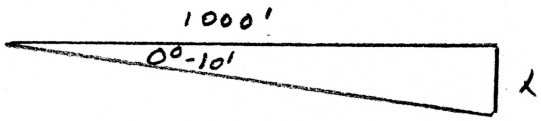
$C = 2\pi r$

$C = 2261.9$

ratio & Prop $\qquad \frac{314.6}{2261.9} \quad \frac{x}{360^\circ}$

$x = 50^\circ$

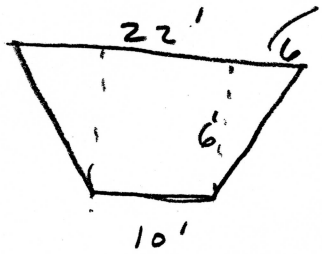
13



$\sin 0°\text{-}10' = \frac{x}{1000}$ $10' = .16670$

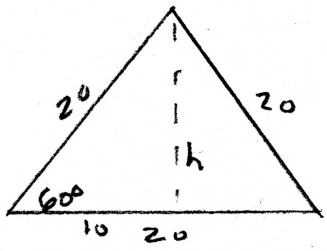
$x = 2.9'$

14



1 + 0 1

15



$A = \frac{1}{2} b \cdot h$

$20^2 + 10^2 = h^2$

$h^2 = 400 - 100$

$h = \sqrt{300}$

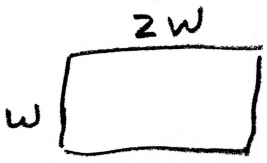
$h = \sqrt{3} \cdot \sqrt{100}$

$h = 10\sqrt{3}$

$A = \frac{1}{2} 20 \cdot 10\sqrt{3}$

$A = 100\sqrt{3} \approx \frac{20 \times 20\sqrt{3}}{4}$

16

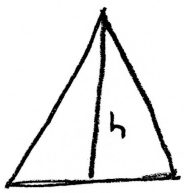


$w \times 2w = 200$

$2w^2 = 200$

$w^2 = 100$

$w = 10$



$h = w$

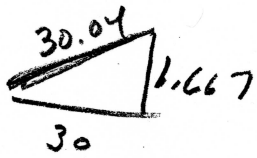
$200 = \frac{1}{2} b \cdot h$

$200 = \frac{1}{2} b \cdot 10$

$20 = \frac{1}{2} b$

$\boxed{b = 40}$

17



$c^2 = 30^2 + 1.667^2$

$c^2 = 902.78$

$A = 2 \times 160 \times 30.04$

$= \boxed{9615}$