Introduction to Area Problems
(1)

$$
\begin{aligned}
&{ }^{4} 4^{4} \\
& 4^{\prime} A=(4)^{2} \\
&=16^{\prime 2}
\end{aligned}
$$

(2)

$$
\sum_{24^{\prime \prime}} \quad A=\frac{1}{2}(18)(24)
$$

(3) ${ }^{15^{\circ} \square_{24^{\circ}}} \frac{24^{\prime \prime}}{15^{\prime \prime}}$

$$
\begin{aligned}
& A=(15)(24) \\
& =360 \mathrm{in}^{2}
\end{aligned}
$$



$$
\begin{aligned}
& A=(15)(28) \\
& =420 \mathrm{ft}^{2}
\end{aligned}
$$

(5) $A=\frac{1}{2}(10)(12)$

$$
=60 \mathrm{ft}^{2}
$$

(6) $\sqrt{{\sqrt{21^{\prime \prime}}}_{30^{\prime \prime}}^{25^{\prime \prime}}}$

$$
\begin{aligned}
& A=\frac{(25+30)(21)}{2} \\
& =577.5 \mathrm{in}^{2}
\end{aligned}
$$

II

(2) $\frac{11^{12^{4}}}{36^{\circ}}<-A=360 \mathrm{in}^{2}$

$$
\begin{aligned}
& 360=\frac{(x+36)(12)}{2} \\
& 720=(x+36)(12) \\
& 60=(x+36) \\
& 24^{\circ}=x
\end{aligned}
$$

(3)


$$
\begin{aligned}
& 22=x \sqrt{2} \\
& 11 \sqrt{2}=x \\
& A=(11 \sqrt{2})(36) \\
&=396 \sqrt{2} \mathrm{ft}^{2} \\
&(\operatorname{lor} 560.03)
\end{aligned}
$$


(4)

(5)

$$
\begin{aligned}
& 54=\frac{1}{2}(12)(x) \\
& x=9 \mathrm{ft}
\end{aligned}
$$

$$
\begin{aligned}
& \text { (6) } \begin{array}{l}
20 \mathrm{~cm} \quad 30=x \cdot \sqrt{2} \\
1,0 \quad 15 \sqrt{2}=x \\
A=\frac{1}{2}(15 \sqrt{2})(15 \sqrt{2}) \\
=225 \mathrm{~cm}^{2}
\end{array} .
\end{aligned}
$$

$$
\begin{aligned}
& \text { (7) } \begin{array}{l}
24=x \sqrt{3} \\
84 \sqrt{3}=x \\
A=\frac{1}{2}(8 \sqrt{3})(24) \\
=96 \sqrt{3} \mathrm{~m}^{2} \\
\approx 166.28 \mathrm{~m}^{2}
\end{array} .
\end{aligned}
$$

Additional Area Problems
(1)

$$
\begin{aligned}
& 225=s^{2} \\
& \begin{array}{l}
15=1 \\
d=15 \sqrt{2} \mathrm{in.} \\
d \approx 21.21 \mathrm{in.} \\
\hline
\end{array}
\end{aligned}
$$

(2)

$$
\begin{array}{ll}
A=30 & 30=\frac{1}{2}(12)(h) \\
5^{\prime \prime}=h
\end{array}
$$

3
(4)

$$
\begin{aligned}
& 2-d_{d_{1}=16}=18 \\
& A=\frac{1}{2}(18)(16) \\
& =144 \\
& s \quad A_{1}=14^{4} \quad 144=s^{2} \\
& 12=s \\
& p=4(12) \\
& =48 \mathrm{in} \\
& \text { (5) } \int_{2 x}^{\overbrace{i 16}^{i}}{ }_{2 x}^{A=288} \\
& 288=\frac{(2 x+x)(16)}{2} \\
& 288=16 x+8 x \\
& 288=24 x \\
& 12=x, 24=2 x
\end{aligned}
$$

(6) $\overbrace{i+108}^{i} \int_{p=96}^{s}$

$$
\begin{aligned}
& 96=4 s \\
& 24=s
\end{aligned}
$$

$24 / 3512 \sqrt{3}$

$$
\begin{aligned}
& A=24(12 . \sqrt{3}) \\
& =288 \sqrt{3} \mathrm{~m}^{2} \\
& \approx 498.83 \mathrm{~m}^{2}
\end{aligned}
$$

(7) $\frac{\square}{2 x}+A=800$

$$
\begin{aligned}
& 800=(x)(2 x) \\
& 800=2 x^{2} \\
& 400=x^{2} \\
& 20 f t=x
\end{aligned}
$$



$$
\begin{aligned}
x^{2}+8^{2} & =10^{2} \\
x^{2} & =36 \\
x & =6
\end{aligned}
$$

$$
96=\frac{(6+6+b+b)(8)}{2}
$$

$$
96=(12+2 b)(4)
$$

$$
96=48+8 b
$$

$$
48=8 b
$$

$$
6=b \text { other base: } x+b+x \rightarrow 6+6+6 \rightarrow 18
$$

Bases: 6 in and 18 in
(9) $\begin{array}{ll}18 \sqrt{2}^{2}-x & 72=18 x \\ 24 & 4 \mathrm{~cm}=x\end{array}$
(10)


$$
\begin{gathered}
36=3 \mathrm{~s} \\
12=\mathrm{s} \\
A=\frac{1}{2}(12)(6 \sqrt{3}) \\
=36 \sqrt{3} \mathrm{ft}^{2} \\
\approx 62.35 \mathrm{ft}^{2}
\end{gathered}
$$

(11)

$$
108=\frac{1}{2}(24)\left(d_{2}\right)
$$

$$
q=d_{2}
$$

12 A $_{4.5} \quad 4.5^{2}+12^{2}=s^{2}$

$$
\begin{aligned}
& s \quad 12 \\
& P=(4)(12.82) \\
& =51.24 \mathrm{in}
\end{aligned}
$$

(12)


$$
\begin{aligned}
& 12=x \sqrt{3} \\
& 4 \sqrt{3}=x
\end{aligned}
$$

$8 \sqrt{3}=2 x \leftarrow$ side length and length of second diagonal

$$
\begin{aligned}
& A=\frac{1}{2}(24)(8 \sqrt{3}) \\
& =96 \sqrt{3} \mathrm{ft}^{2} \\
& \approx 166.28 \mathrm{ft}^{2}
\end{aligned}
$$

(13)

$$
\begin{array}{rl}
A=320 \\
5 x & 320
\end{array}=(x)(5 x)
$$

(14)


$$
\begin{gathered}
150=\frac{1}{2}\left(\frac{3}{4} x\right)(x) \\
150=\frac{3}{8} x^{2} \\
400=x^{2} \\
20=x, 15=\frac{3}{4} x \\
(7.5)^{2}+10^{2}=s^{2} \\
156.25=s^{2} \\
12.5=s \\
P=(4)(12.5) \\
=50 y d
\end{gathered}
$$

(15) $\frac{20\left[\begin{array}{l}\vdots \\ \overbrace{24}^{8} \\ i\end{array}\right]}{}$

$$
\begin{aligned}
A & =24(8) \\
& =192 \\
192 & =20(x) \\
9.6 \text { in } & =x
\end{aligned}
$$

