Sections 8.1 and 8.2

8.1 Angles

What is a plane?

What is an angle?

Vertex
Protractors ➞ do not use or need
- estimate all values and check

Acute Angles  less than 90°

Obtuse Angles  greater than 90°, less than 180°
Right Angles

\[ \angle \]

90° angle

Straight Angles

180° angle

Perpendicular Lines

intersect at 90° angle

short hand \( \perp \)

ex: 4 way stop
sites in a scope
ceiling tiles

Parallel Lines

- never intersect

short hand \( \parallel \)

ex: King to Central
ceiling & floor
railroad tracks
Complementary Angles - angles that make 90°

Supplementary Angles - angles that make 180°

Vertical Angles - scissor angles
With a straight line you have a straight angle or supplementary angles.

\[ \angle 1 + \angle 2 + \angle 3 + \angle 4 = 180^\circ \]

Interior Angles of a triangle are ALWAYS supplementary.
Transversal - a line that intersects 2 or more lines.

Alternate Interior Angles: with parallel lines, create congruent interior angles.
Corresponding Angles

- One interior + one exterior angle
- If parallel, those are the same

Problems
Section 8.2

Polygon

A 2-D closed figure

Vertex

Perimeter - distance around the outside

\[ 13 + 27 + 27 + 32 = 99 \text{ in} \]
Quadrilaterals - 4-sided polygon

Parallelograms → Quadrilateral with 2 sets of parallel sides

Rectangles → Parallelogram with right angles

Squares - Rectangles with all sides the same length

Trapezoid → One set of parallel sides called bases
Area of Rectangles

\[ A = L \times W \]

\[ \begin{align*}
5' & \quad A = 10 \text{ ft}^2 \\
2' & \quad P = 5 + 5 + 2 + 2 \\
& \quad P = 2(5) + 2(2) \\
& \quad = 14 \text{ ft} \\
13 \text{ ft} & \quad \frac{A}{L} = \frac{LW}{L} \\
? & \quad \frac{A}{L} = W \\
& \quad \frac{39.3 \text{ ft}^2}{13 \text{ ft}} = 3.02 \text{ ft} 
\end{align*} \]

\[ 39.3 \text{ ft}^2 : 13 \text{ ft} = 3.02 \text{ ft} \]

Area of Square

\[ A = s^2 \quad \text{or} \quad LW \]

\[ \begin{align*}
s & \quad s = 12 \text{ in} \\
A & \quad = 144 \text{ in}^2 \\
P & \quad = 4(12) \\
& \quad = 48 \text{ in} 
\end{align*} \]
Area of Parallelogram

\[ A = B \cdot H \]

\[ A = 22 \cdot 5 \]
\[ A = 110 \text{ ft}^2 \]
\[ P = 2(22) + 2(8) \]
\[ 60 \text{ ft} \]

Area of Trapezoid

\[ A = \frac{1}{2} h (b_1 + b_2) \]

\[ A = \frac{1}{2} (5)(10 + 17) \]
\[ A = \frac{1}{2} (5)(27) \]
\[ A = \frac{1}{2} (135) \]
\[ A = 67.5 \text{ ft}^2 \]
A room is 24 feet by 32 feet. How many square yards of carpet will we need to carpet the room?

\[
\frac{768 \text{ ft}^2}{1 \text{ yd}^2} \cdot \frac{1 \text{ yd}^2}{9 \text{ ft}^2} = 85.3 \text{ yd}^2
\]

What if it costs $35.98 per square yard?

\[
85.3 \text{ yd}^2 \times \$35.98 \text{ yd}^{-2} = \$3069.09
\]
What if in that same room (24x32), you want a tile inlay for looks. So it look like below:

What is the area of the trapezoidal tile inlay?

\[ A = \frac{1}{2}(17)(26 + 28) \]
\[ A = 459 \text{ ft}^2 \]

What percentage of the room in the earlier problem is in carpet?

\[ \text{tile} \rightarrow 459 \text{ ft}^2 \]
\[ \text{room} \rightarrow 768 \text{ ft}^2 \]
\[ \frac{459}{768} = 59.7\% \text{ tile} \]
\[ \text{carpet} \rightarrow 100 - 59.7 \]
\[ \frac{309}{768} = 40.3\% \]
How much transition will I need for tile to carpet?

Need more measurements

26
?
28
?

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