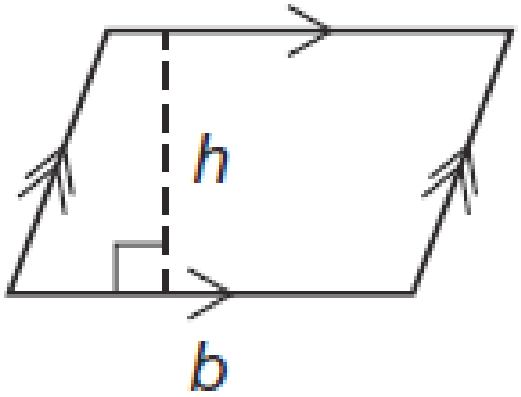
Lesson 22

Finding Areas of Quadrilaterals

Area of a Parallelogram – To find the area of a parallelogram (A), use this formula, where b is the length of the base, and h is the height.

$$A = bh$$



Since rectangles, rhombuses, and squares are all types of parallelograms, the areas of these shapes can also be found using this formula.

Example 1 Finding Areas of Parallelograms

Find the area of each parallelogram.

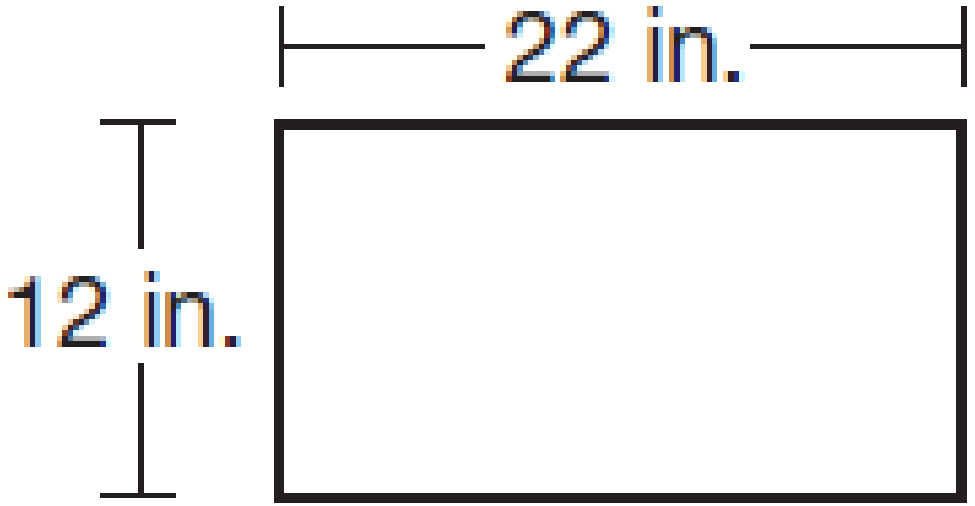
a.

SOLUTION

$A = bh$

$= (22 \text{ in.})(12 \text{ in.})$

$= 264 in^2$



Example 1 Finding Areas of Parallelograms

Find the area of each parallelogram.

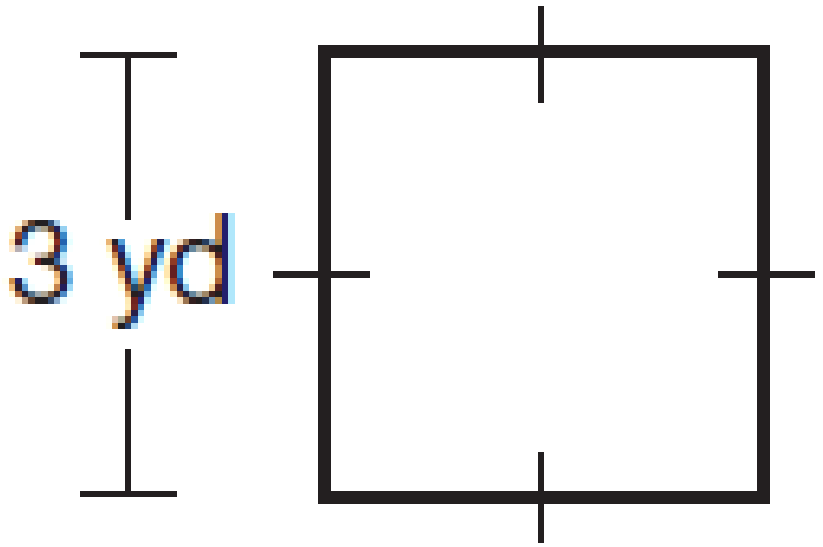
b.

SOLUTION

$A = bh$

$= (3\ \text{yd})\ (3\ \text{yd})$

$= 9yd^2$



Example 1 Finding Areas of Parallelograms

Find the area of each parallelogram.

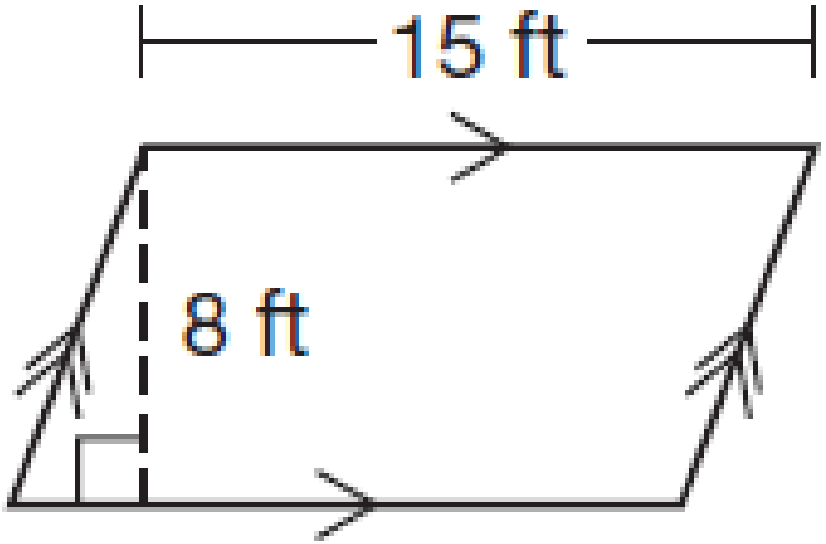
c.

SOLUTION

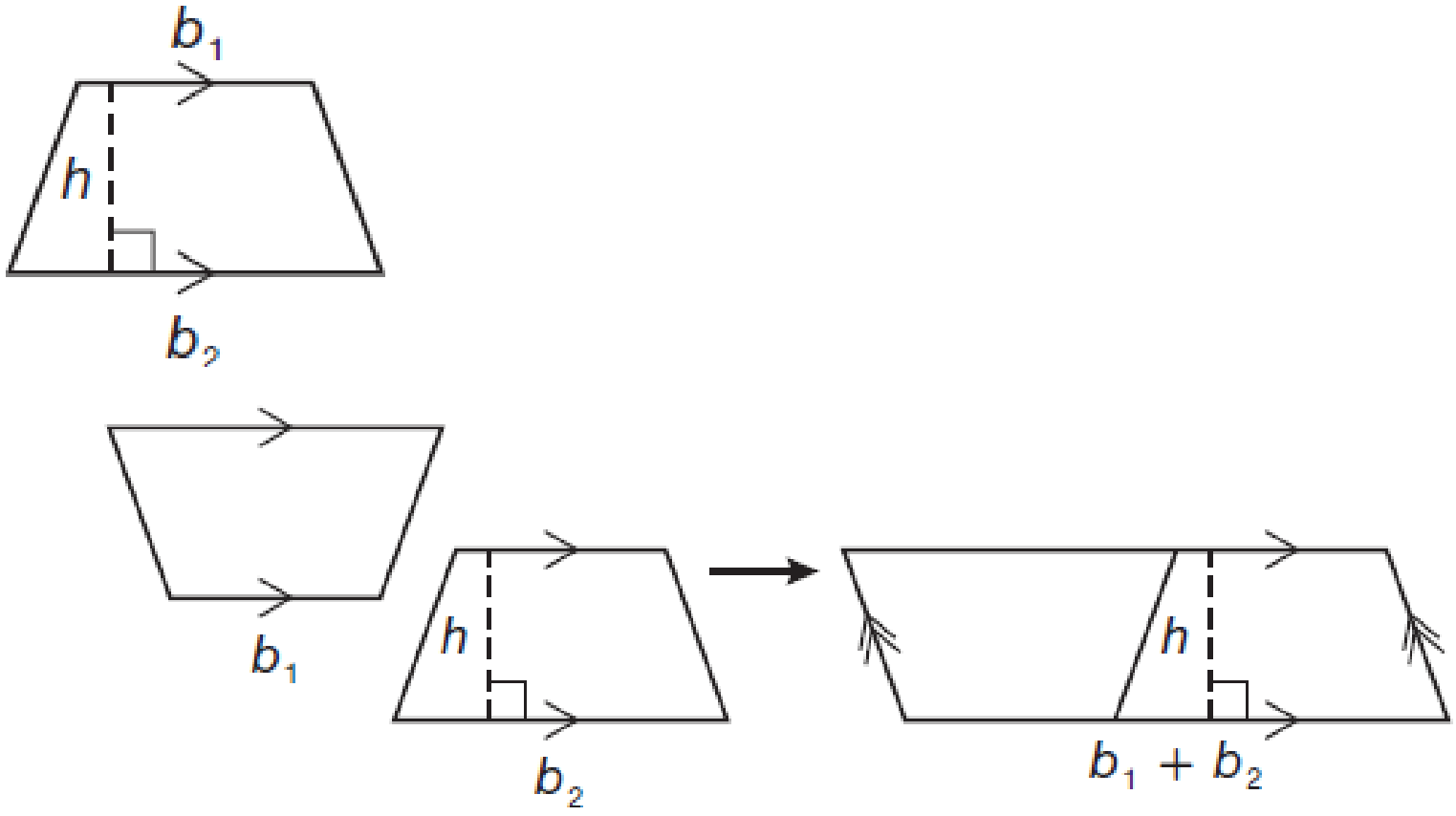
$A = bh$

$= (15 \text{ ft})\ (8 \text{ ft})$

$= 120 ft^2$

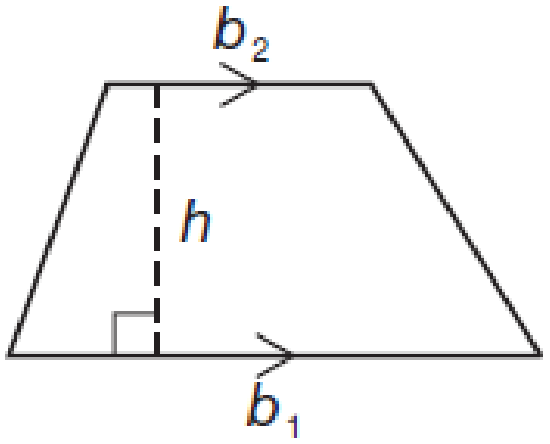


Area of a Trapezoid



Area of a Trapezoid – To find the area of a trapezoid (*A*), use the following formula, where b_1 is the length of one base, b_2 is the length of the other base of the trapezoid, and *h* is the trapezoid's height.

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



Example 2 Finding Areas of Trapezoids

Find the area of each trapezoid.

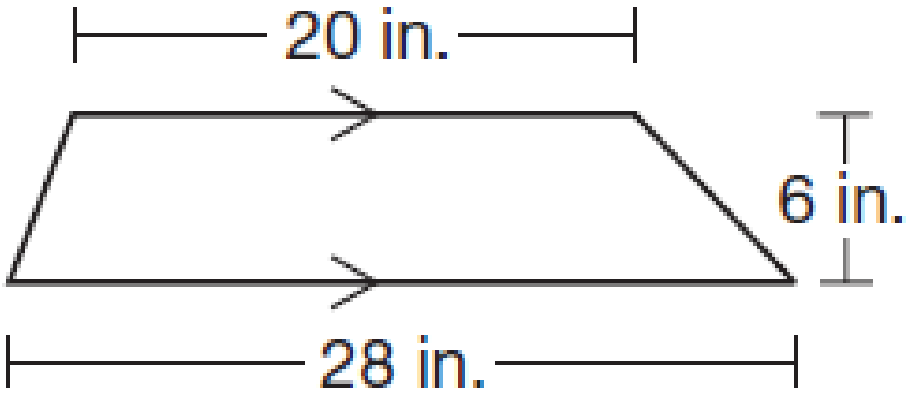
a.

SOLUTION

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

$$A = \frac{1}{2}(20in. + 28in.)6in$$

$$A = 144in^2$$



Example 2 Finding Areas of Trapezoids

Find the area of each trapezoid.

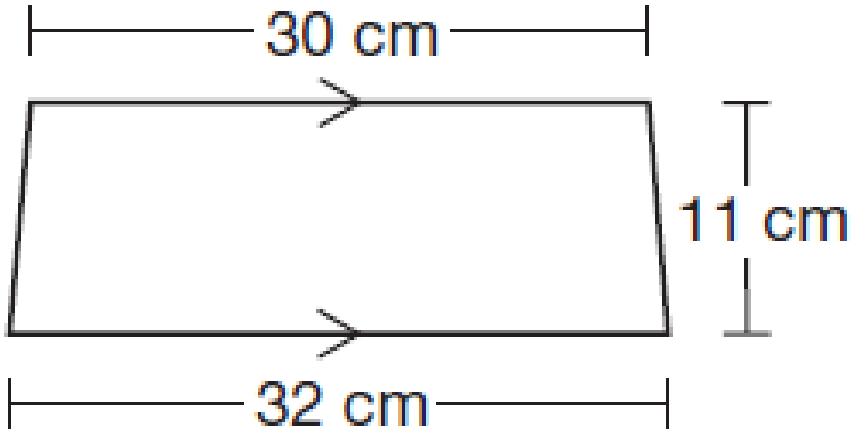
b.

SOLUTION

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

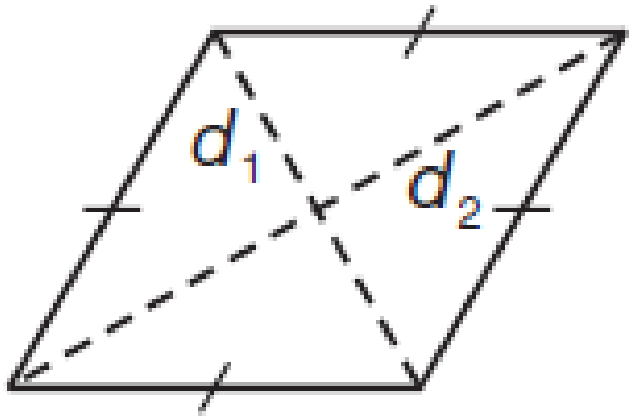
$$A = \frac{1}{2}(30cm + 32cm)11cm$$

$$A = 341cm^2$$



Area of a Rhombus – To find the area of a rhombus (*A*), use the following formula, where *d* 1 is the length of one diagonal, and *d* 2 id the length of the other diagonal of the rhombus.

$$A = \frac{1}{2} d_1 d_2$$



Example 3 Finding Areas of Rhombuses

Find the area of each rhombus.

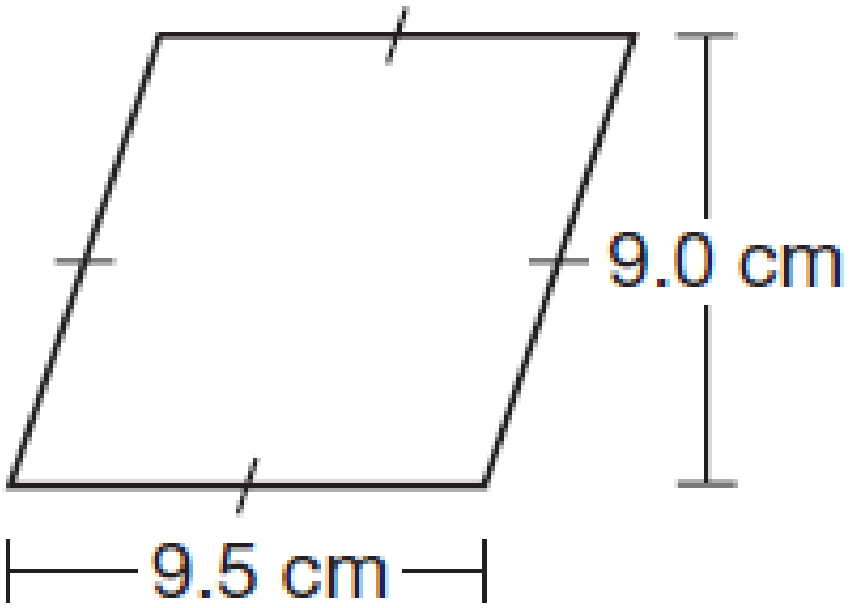
a.

SOLUTION

$A = bh$

A= 9.5 cm $\times$ 9.0 cm

$A = 85.5in^2$



Example 3 Finding Areas of Rhombuses

Find the area of each rhombus.

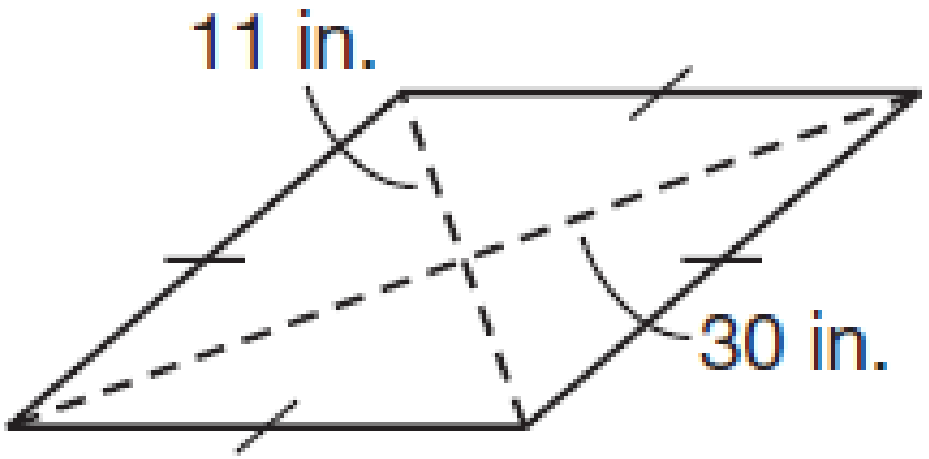
b.

SOLUTION

$$A = \frac{1}{2} d_1 d_2$$

$$A = \frac{1}{2}(11 \text{ in.} \times 30 \text{ in.})$$

$$A = 165 in.^2$$



Example 4 Application: Carpeting

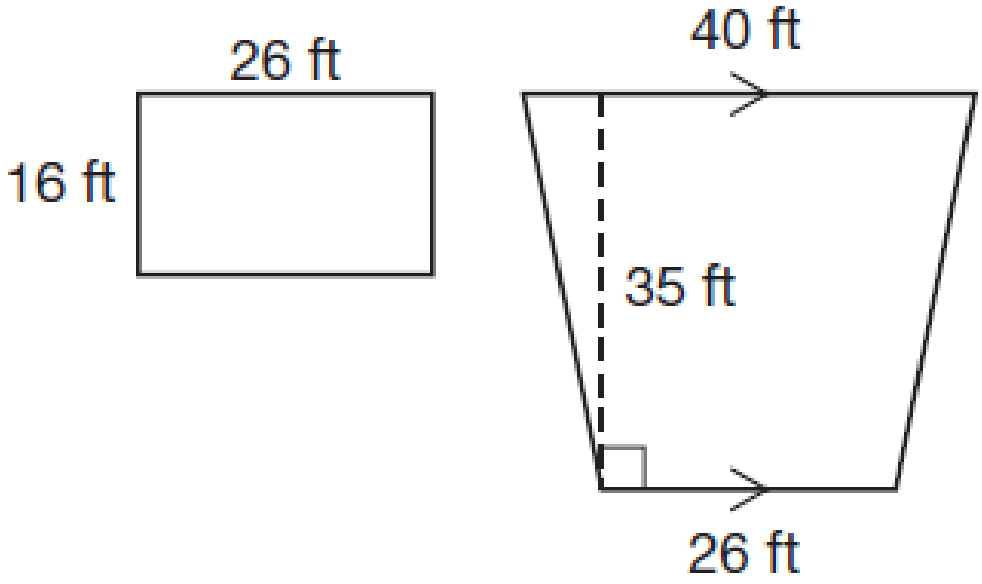
Two areas of a day care need to be carpeted. The play area is shaped like a trapezoid, and the supplies area is shaped like a rectangle. Use the diagram of these two areas to determine the total area that needs to be carpeted.

SOLUTION

$A = lw$

$= 26 \times 16$

$= 416 ft^2$



Example 4 Application: Carpeting

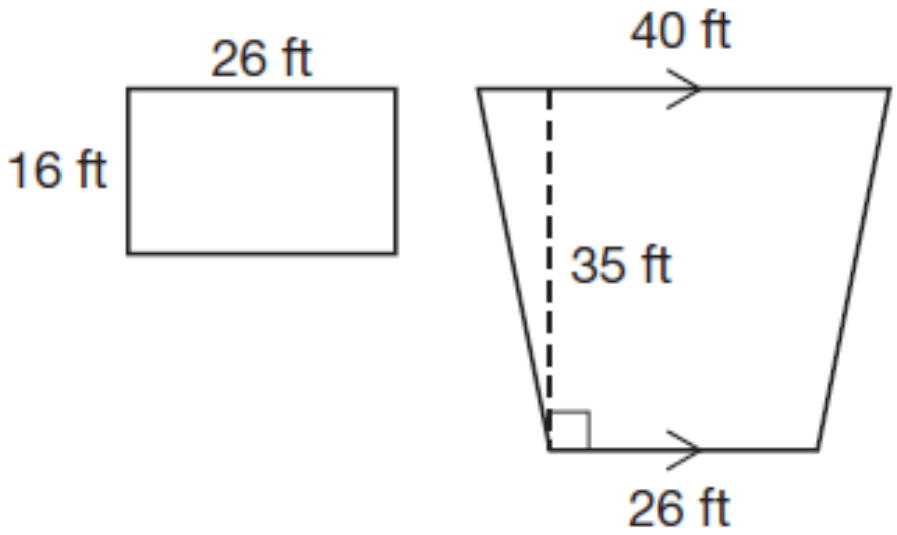
For the trapezoidal play area,

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

$$A = \frac{1}{2}(40\ ft + 26\ ft)35\ ft$$

$$A = \frac{1}{2}(66\ ft)(35\ ft)$$

$$A = 1155\ ft^2$$



$(416 + 1155)\ ft^2$

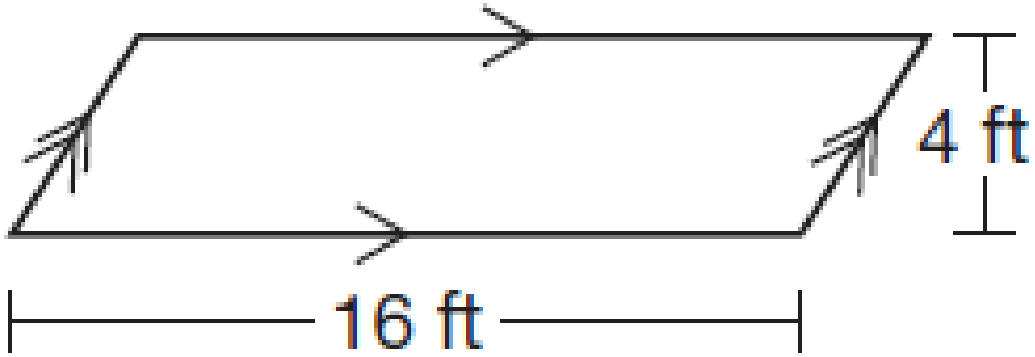
$= 1571\ ft^2$

Therefore, a total area of 1571 square feet needs to be carpeted.

You Try!!!!

Find the area of each parallelogram.

b.



You Try!!!!

c.Find the area of a trapezoid with parallel sides measuring 14 centimeters and 21 centimeters and a height of 13 centimeters.

e. Find the area of a rhombus that has diagonal lengths of 8 inches and 11 inches.

Assignment

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Lesson Practice (Ask Mr. Heintz)

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Practice 1-30 (Do the starred ones first)