Problem 2 Landscape Architect

You are a landscape architect, and many customers are asking for trapezoid shaped gardens. The formula for the area of a trapezoid is

$A = \frac{1}{2}h(B + b)$, where B represents base one, b represents base 2, and h represents the height.

1. Solve the equation for b.

$$b = \frac{2A}{h} - B$$

2. Compute the appropriate values of b for the gardens indicated in the table. Show 2 decimal places for the b column.

Customer	Area (ft^2)	B (feet)	Height (ft)	b (feet)
Smith	120	11	12	9
Martin	160	13	16	7
Weinstein	500	40	20	10
Harris	350	50	12	8.$\overline{3}$
(your last name)	400	Day your birthday is	Month of your birthday	

3. If the garden has an area of 750 ft^2 and the bases are 10 and 23 feet long, what is the height of the garden?

$$h = \frac{2A}{(B+b)} \qquad h = \frac{1500}{33} \approx 45.45 ft.$$

4. The garden company charges based on the area of the garden. The company spends $36 per square foot and charges $47 per square foot on a job. What is the profit of the Martin garden?

$$Profit = Area\ (charge - costs)$$
$$= Area \cdot \$11$$

$$160 \cdot 11 = \boxed{\$1,760.00}$$

Key

Problem 1 Swimming Pool Salesperson

You design and sell swimming pools. For customers who want round pools, the formula for the volume of the pool is simple $V = \pi r^2 d$, where r represents the radius and d represents the depth

Where r is the pool radius and d is the depth of the water. Different customers have different sized yards, so they can fit different diameter pools. For the volume to be $4,000 ft^3$, you will have to choose the appropriate depth for each radius.

1. Solve the equation for depth.

$$d = V / \pi r^2$$

2. Compute the appropriate depth values for the pools indicated in the table. Show 2 decimal places for the depth column.

Customer	Volume (ft^3)	Diameter (ft)	Calculated Radius	Calculated depth (ft)
Goodman	4000	30	15	5.66
Smith	4000	25	12.5	8.15
Jordan	4000	40	20	3.18
Henry	4000	20	10	12.73

3. Now they have a customer that wants a custom pool that has a volume of 7000ft^3 and a depth of 12 feet. What is the diameter of the custom pool?

* We can solve for the pool's radius; Diameter = radius · 2

$$r = \sqrt{V / \pi d}$$

$$r = \sqrt{\frac{7000}{\pi \cdot 12}} = 13.63 ft.$$

4. If the company charges an initial fee of $150 for creating the design and then $72 per foot based on the volume. Write an equation and solve for the price of the custom pool.

total
C: cost of pool

$$C = 150 + 72x$$

x: # cubic feet

5. If the company spends $56 per foot, how much of a profit did the company make on the custom pool?

The company will earn the initial fee ($150.00) AND the difference between what they charge ($72.00) and their costs (−56 $)

P: profit

$$P = 150 + (72 - 56)x$$
$$P = 150 + 16x \rightarrow 150 + 16(7000)$$
$$\$112,150$$

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