Problem Set 1 — The Private Firm CFO

Building the cap table: Houzz, from formation to Series B

MGT 816 — Yale School of Management — Fall 2026 — Professor John M. Barrios

Due: Wednesday, September 23, 2026, 1:00 pm. **Points:** 40 (of the two problem sets, *both* count — 40 + 40). **Format:** one submission per group (2–4 students).

How to submit. The primary way to do this problem set is the online workbench (linked from the course site on September 9); it structures the cap tables and computes ownership % from the share counts you enter, then generates a submission file you upload to Canvas. **This document is the complete assignment and an accepted fallback**—you may instead work in Excel or on paper and upload a PDF or workbook with the same answers. Put every group member's name on whatever you submit.

Honor & AI policy. Every number you submit must be your group's own work; you must be able to reproduce and defend each figure. AI tools may be used as a study aid. The closed-book final tests the same mechanics without AI.

The assignment

Two founders start a company, take in an angel, raise a Series A with an option pool, and come back for a Series B. Over four parts you will build **Houzz**'s capitalization table from formation through Series B, watch each round dilute the founders, test how negotiating the option pool and the valuation changes the outcome, and then advise the founders in a short email. Everything you need is given in each part's story and summarized in the Exhibits at the end. Points: Part I 18 · Part II 10 · Part III 8 · Part IV 4.

Convention used throughout: an option pool is *carved from the pre-money*—it sits in the fully-diluted denominator before the new investor's percentage is set, so existing holders absorb the pool's dilution. Key identities: Post = Pre + Investment; the fully-diluted total $Z = S_{\text{existing}}/(1 - x_{\text{new}} - \text{pool}\%)$; and price per share = investment ÷ new preferred shares.

Part I — Formation, Seed, and Series A (18 points)

Houzz started as a fix for its founders' own headache. Mid-remodel and buried in contractor bids and paint swatches, **Katy Perry** and **Snoop Dogg** built a web app to tame the chaos—mood boards, a directory of vetted pros, and a marketplace for the furniture people actually wanted. The side project caught on, and one spring they incorporated, walked away from their day jobs, and split the company down the middle: each founder put in **$30,000** for **600,000** common shares. You are Houzz's first finance hire—build the cap table and keep it honest as the company raises capital.

(a) Formation

1. Record the journal entry for the founders' stock purchase.
2. Build the formation cap table (shares and ownership % for each founder).

(b) Series Seed — $1.5M on $7.5M post

With traction but an empty bank account, the founders take angel investor **Mark Cuban**'s check: **$1.5M** at a **$7.5M post-money** valuation ($6.0M pre-money).

1. Record the journal entry for the seed round.
2. Update the cap table (common and seed preferred; ownership %).
3. Report the pre-money and post-money valuation, the price per share, and the founders' combined ownership after the round.

(c) Series A — $12M on $50M post, with a 16% option pool

Eighteen months later, **Greylock Partners** leads a **$12M** round at a **$50M post-money** valuation. The term sheet requires a **16%** unallocated option pool after the round (fully diluted, carved from the pre-money). **Mark Cuban** exercises his pro-rata right for **20%** of the Series A check; **Greylock** takes the remaining 80% (Exhibits 1–2).

1. Record the journal entry for the Series A, and state what entry, if any, the option-pool creation requires.
2. Build the Series A cap table with the unallocated option pool as its own row (common, seed pref, Series A pref; ownership %).
3. Report the Series A price per share, each founder's ownership %, Greylock's %, and Mark Cuban's %.
4. Report the founders' combined dilution since formation (in percentage points) and the change in Cuban's ownership from just after the seed to just after the Series A.

Part II — Negotiating the pool and the valuation (10 points)

The night before signing, Katy asks whether they can do better. The Series A investment stays **$12M**, but the founders push on two levers: the **option pool size** and the **post-money valuation**. Work three scenarios (Exhibit 3), each starting from your Part I Series A cap table and each independent of the others:

- **Scenario 1** — a smaller **12%** option pool at the same **$50M** post-money.
- **Scenario 2** — a higher **$60M** post-money with the original **16%** pool.
- **Scenario 3** — both levers: a **12%** pool at a **$60M** post-money.

1. For each scenario, report the price per share, each founder's ownership %, Greylock's %, and Cuban's %.
2. Which lever should the founders push hardest, and why?
3. Who bears the cost of the option pool in each scenario? Explain.

Part III — Series B and the option-pool top-up (8 points)

A year on, Houzz is a real business and the checks are bigger. **Series B:** Houzz raises **$27M** at a **$105M post-money** valuation—**Sequoia Capital** leads with **$18M** and **Greylock** follows on with **$9M**. After the round, unallocated options must equal **12%** of fully diluted shares.

Start from your **Part I Series A** cap table (the signed 16% deal). Since then, of the **400,000**-share option pool, **80,000** options have been granted (allocated and outstanding) and **320,000** remain unallocated (Exhibit 4). The Series B top-up is carved from the pre-money, just like the Series A pool.

1. Build the Series B cap table (all stakeholders, including allocated and unallocated options; ownership %).
2. Report the Series B price per share.
3. How many new option shares must be created so the unallocated pool equals 12% of the post-round fully-diluted total? Report that unallocated pool as a % of fully-diluted shares after Series B.
4. Report each founder's ownership % after Series B, and show your work for the pool top-up and the founders' ending stake.

Part IV — The founder email (4 points)

Write an email to Katy and Snoop (maximum **5 sentences**): given your Part II analysis, should they negotiate for the smaller pool, the higher valuation, or both—and who pays for the pool either way? Make a clear recommendation.

Exhibits

The exhibits below collect the given facts of the case. They contain no answers; the blank template in Exhibit 5 is provided for those working on paper.

Exhibit 1. Financing summary. All amounts are the round's headline figures.

Round	Lead / participants	Raised	Post-money	Pool (post, FD)
Formation	Katy Perry & Snoop Dogg	$60,000	—	—
Seed	Mark Cuban (angel)	$1.5M	$7.5M	—
Series A	Greylock (lead) + Cuban	$12M	$50M	16%
Series B	Sequoia (lead) + Greylock	$27M	$105M	12% (topped up)

Founders: 600,000 common shares each at formation ($30,000 each). Option pools are carved from the pre-money.

Exhibit 2. Round participation.

Round	Investor	Share of the check
Series A ($12M)	Greylock (lead)	80%
Series A ($12M)	Mark Cuban (pro-rata)	20%
Series B ($27M)	Sequoia (lead)	$18M
Series B ($27M)	Greylock (follow-on)	$9M

Exhibit 3. Part II negotiation scenarios (Series A investment fixed at $12M).

Scenario	Option pool	Post-money
1 — Smaller pool	12%	$50M
2 — Higher valuation	16%	$60M
3 — Both levers	12%	$60M

Exhibit 4. Option pool before Series B. The Series A pool has been partly granted:

Series A option pool (total)	400,000
Allocated & outstanding (granted to employees)	80,000
Unallocated (available)	320,000

Exhibit 5. Blank cap-table template (for work on paper; add or remove holder rows as needed).

Holder	Common	Seed	Ser. A	Ser. B	Options	Own. %
Total						