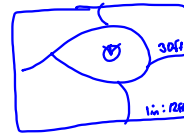8.4 Proportions and Scale Drawings

Proportions
two ratios that are equal
$$\frac{a}{b} = \frac{c}{d}$$

Scale Drawings

ratio
$$\frac{1\text{in}}{12\text{ft}} = \frac{6\text{in}}{72\text{ft}}$$
×6

$$\frac{1\text{in}}{12\text{ft}} \bowtie \frac{2.5\text{in}}{X} \qquad 12 \cdot 2.5 = 1 \cdot X$$
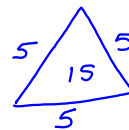$$30 = X$$

$$\frac{2\text{in}}{50\text{ft}} \bowtie \frac{4.5\text{in}}{X}$$
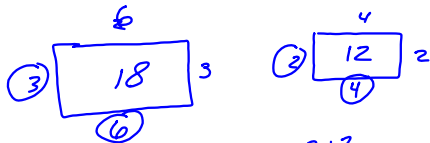$$50 \cdot 4.5 = 2 \cdot X$$
$$\frac{225}{2} = \frac{2 \cdot X}{2}$$
$$112.5 = X$$

112.5ft

Perimeter = Sum of sides

5 5
15
5

2 6 2
2

scale ratio 5:2
Perimeter scale 15:6 → 5:2

6
3 18 3
6

4
2 12 2
4

scale ratio 3:2
Perimeter scale 18:12 → 3:2

The perimeter scale is the same as the original scale ratio

×7
$$\frac{4}{7} = \frac{28}{49}$$
×7

×21
$$\frac{2}{5} = \frac{42}{105}$$
×21

Slide 1

Area

| 18 | 3 | | 8 | 2 |

6   4

Scale ratio 3:2
Area ratio 18:8 → 9:4

Slide 2

| 37.5 | 5 | | 1.5 | 1 | 15)375 = 25
                    | 1.5 | 30
7.5   75
                                      75
scale ratio 5:1   0
Area Ratio 37.5:1.5 ⇒ 25:1

Slide 3

3:2 scale Ratio
9:4 Area Ratio
$3^2 : 2^2$

5:1 scale Ratio
25:1 Area Ratio
$5^2 : 1^2$

Connected to how we label

[ ] 3in
6in $18in^2$

Slide 4

The Area scale is equal to the __square__ of the original scale ratio

$\dfrac{7}{9} = \dfrac{49}{81}$

$\dfrac{3^2}{7^2} = \dfrac{}{98}$

$\dfrac{9}{49} = \dfrac{18}{98}$ (×2)

Slide 5

P 419 – 421
2 – 32 even
33 – 39 all