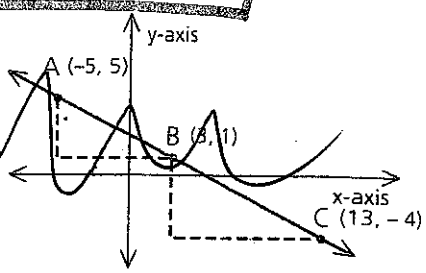
DO [6, 8, 10, 12, 13]

Problem Set A, *continued*

5 **a** Use the coordinates of points A and B to find the slope of $\overleftrightarrow{AC}$.

b Use the coordinates of points B and C to find the slope of $\overleftrightarrow{AC}$.

c Should your answers in parts **a** and **b** be the same?



6 Find the ratio of x to y if

a $2x = 3y$ **b** $6(y + 3) = 2(x + 9)$ **c** $\frac{3}{x + 5} = \frac{9}{y + 15}$

7 What is the ratio of the number of diagonals in a pentagon to the measure of each exterior angle of a regular decagon?

8 Given two squares with sides 5 and 7,

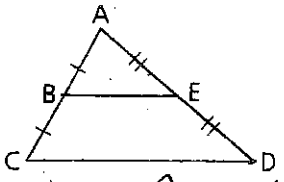
a What is the ratio of their perimeters?

b What is the ratio of their areas?

9 If the ratio of the measures of a pair of sides of a parallelogram is 2:3 and the ratio of the measures of the diagonals is 1:1, what is the most descriptive name of the parallelogram?

10 **a** What is the ratio of AB to BC?

b What is AB:AC?



11 Find the geometric mean(s) between each pair of extremes.

a 4 and 25 **b** 3 and 5 **c** a and b

12 A 60-m steel pole is cut into two parts in the ratio of 11 to 4. How much longer is the longer part than the shorter?

13 The ratio of the measures of the sides of a quadrilateral is 2:3:5:7. If the figure's perimeter is 68, find the length of each side.

Problem Set B

14 Find the positive arithmetic and geometric means between each pair of numbers. Note which mean is greater in each case.

a 8 and 50 **b** 6 and 12

15 If 4 is a mean proportional between 6 and a number, what is the number?

Do 17, 19, 20, 21, 22

16 Copy the number line and locate the arithmetic mean and the positive geometric mean between the two numbers.

17 The ratio of the measure of the supplement of an angle to the measure of the complement of the angle is 5:2. Find the measure of the supplement.

18 Is $\frac{x-5}{4} = \frac{c}{3}$ equivalent to $\frac{x-1}{4} = \frac{c+3}{3}$? (Hint: Use what was proved in sample problem 6 as a theorem.)

19 If $x(a + b) = y(c + d)$, find the ratio of x to y.

20 If $ex - fy = gx + hy$, find the ratio of x to y.

21 Reduce the ratio $\frac{x^2 - 7x + 12}{x^2 - 16}$ to lowest terms.

22 The length of a model plane is $10\frac{1}{2}$ in. The scale of the model is 1:72.

a What is the length of the real plane?

b If the real plane has a wingspan of $43\frac{1}{2}$ ft, find the wingspan of the model.

c If another model of the same plane has a scale of 1:48, find the length of that model.

Problem Set C

23 Show that no polygon exists in which the ratio of the number of diagonals to the sum of the measures of the polygon's angles is 1 to 18.

24 If $\frac{a}{b} = \frac{c}{d}$, show that $\frac{a-b}{b} = \frac{c-d}{d}$.

25 In the figure, P is said to *divide* $\overline{AB}$ *externally* into two segments, $\overline{AP}$ and $\overline{PB}$. If $AB = 30$ and $\frac{AP}{AB} = \frac{5}{2}$, find AP.

26 The equation $y = \frac{5}{2}x - 3$ relates the x- and y-coordinates of points on a line. Find the points on the line whose x-coordinates are 6 and 10. Then use these points to find the slope of the line.

Problem Set D

27 If two ratios are formed at random from the four numbers 1, 2, 4, and 8, what is the probability that the ratios are equal?

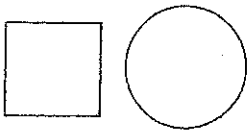
Part Three: Problem Sets

Do 1, 2, 3, 4, 5

Problem Set A

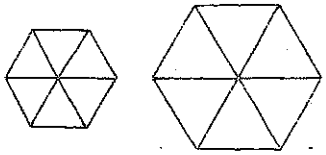
1 Which pairs of figures *appear* to be similar?

a

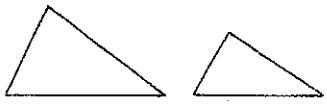


b

c

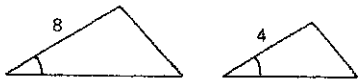


d

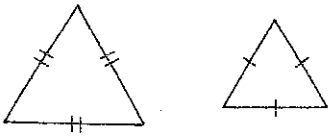


2 Which pairs of polygons *can be proved* to be similar?

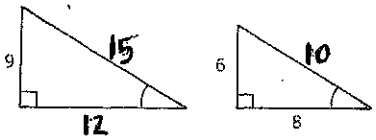
a



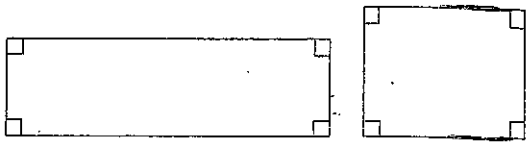
b



c

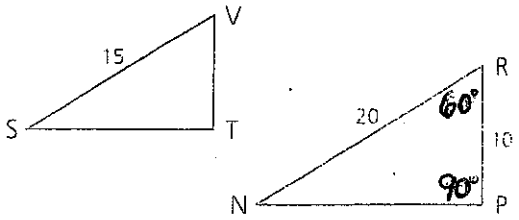


d



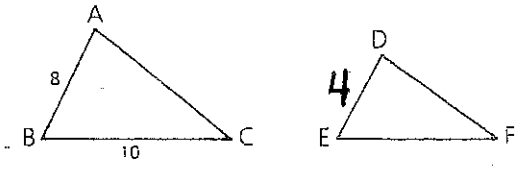
3 Given: $\triangle NPR \sim \triangle STV$,
$m\angle P = 90$, $m\angle R = 60$,
$SV = 15$, $NR = 20$, $RP = 10$

Find: $m\angle T$, $m\angle S$, and VT



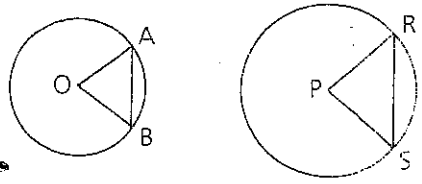
4 Given: $\triangle ABC \sim \triangle DEF$,
with lengths as shown

Find: EF



5 Given: $\odot O$, $\odot P$, $\triangle AOB \sim \triangle RPS$,
$OA = 2$, $AB = 3$, $PR = 6$

Find: PS and RS



6 Find the mean proportionals between each pair of extremes.

a 4 and 25 b 2 and 5

7 If $3x = 5y$, find the ratio of x to y.

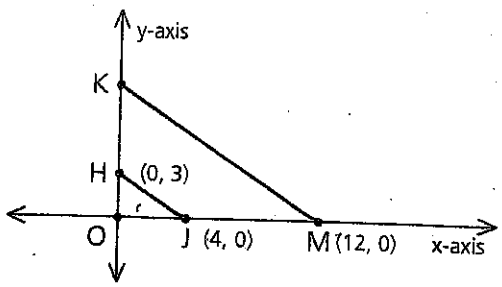
Do 8, 9, 10, 11, 13, 14

8 $\triangle OKM$ is a dilation of $\triangle OHJ$, with a dilation ratio of 3:1 for each pair of corresponding sides.

a Find the coordinates of K.

b Find the lengths of the sides of $\triangle OHJ$.

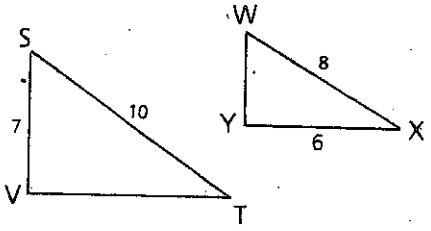
c Find the lengths of the sides of $\triangle OKM$.



Problem Set B

9 Given: $\triangle SVT \sim \triangle WYX$, with measures as shown

Find: WY and VT



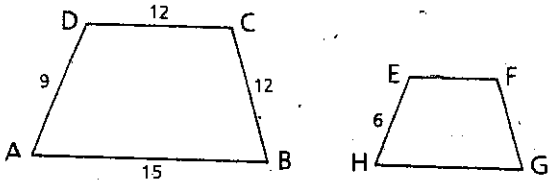
10 Given: Quad ABCD ~ quad HGFE, with measures as shown

Find: a The ratio of lengths of corresponding sides

b EF

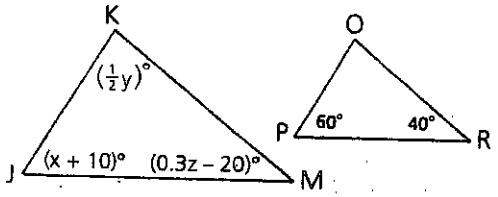
c The perimeter of EFGH

d The ratio of the perimeters



11 Given: $\triangle KJM \sim \triangle OPR$, with angles as shown

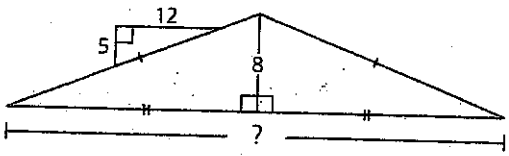
Find: $\frac{x + y + z}{2}$



12 Find the ratio of the fourth proportional of 1, 2, and 3 to the fourth proportional of 4, 5, and 6.

13 If $\frac{8}{2x - 3y} = \frac{7}{6x - 4y}$, find the ratio of x to y.

14 The roof of a house has a slope of $\frac{5}{12}$. What is the width of the house if the height of the roof is 8 ft?



15 Hammond R. looked at the plans for the new house he was building. The plans were drawn to a scale of $\frac{1}{4}$ in. = 1 ft. He measured the size of a room on the plans and found it to be 2.75 in. by 3.5 in. About how large is the room?