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Cumulative Practice
for Chapters 1 to 3

Draw a horizontal number line to represent each set of numbers.

1. Prime numbers less than 25

2. Mixed numbers between -6 and -7 with an interval of $\frac{1}{5}$ between each pair of mixed numbers

Arrange the following numbers from least to greatest.

3. 13, -5, -8, 2, -10, 6, -20, 0

_____ _____ _____ _____ _____ _____ _____ _____

least greatest

Arrange the following numbers from greatest to least.

4. -12, 7, 20, -16, -4, 25, 0, -30

_____ _____ _____ _____ _____ _____ _____ _____

greatest least

Complete each inequality using $>$ or $<$.

5. -36 ☐ 2

6. $7\frac{7}{8}$ ☐ $-7\frac{7}{9}$

7. 8 ☐ -10

8. -12 ☐ -25

9. $\sqrt[3]{216}$ ☐ $-\sqrt{81}$

10. 3^3 ☐ 2^4

11. $|-80|$ ☐ $|-100|$

12. $|600|$ ☐ $|-700|$

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Express each number as a product of its prime factors.

13. 56 _____

14. 180 _____

Find the greatest common factor of each set of numbers.

15. 36 and 42 _____

16. 24, 48, and 84 _____

Find the least common multiple of each set of numbers.

17. 6 and 14 _____

18. 21, 28, and 42 _____

Find the value of each of the following.

19. The square of 14 _____

20. The cube of 30 _____

21. The square root of 324 _____

22. The cube root of 1,728 _____

23. $10^2 - \sqrt[3]{729} =$ _____

24. $\sqrt[3]{512} \div \sqrt{64} \times \sqrt[3]{343} =$ _____

25. $2\frac{2}{5} \times \frac{3}{4} =$ _____

26. $1\frac{5}{6} \div \frac{4}{9} =$ _____

27. $3.7 \times 2.5 =$ _____

28. $18.5 \div 2.5 =$ _____

Solve. Show your work.

29. The mass of a bag of flour is 7 kg 500 g. Joyce repacks the flour into 12 small packs of equal mass. What is the mass, in kilograms, of each small pack of flour? (1 kg = 1,000 g)

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30. A chef buys $4\frac{1}{2}$ pounds of broccoli. A casserole recipe calls for $\frac{3}{4}$ pound of broccoli. How many casseroles can the chef prepare before she runs out of broccoli?

31. A bottle has a mass of 1.8 kilograms when it is completely filled with juice. It has a mass of 1.23 kilograms when $\frac{3}{8}$ of the juice is removed. What is the mass of the empty bottle?

32. Paul paid $25.50 for 3 cups of hot chocolate and 4 cups of hot tea. The cost of each cup of tea was $\frac{2}{3}$ the cost of each cup of hot chocolate. How much did each cup of hot chocolate cost?

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33. Josie spent $\frac{4}{7}$ of the money in her purse on some books, and the rest of the money on 18 markers. Each marker cost \$1.20. How much money was in Josie's purse to begin with?

34. A cereal bar is sold individually for \$2.40 or in packs of 4 for \$8 per pack. Roxie wants to buy exactly 38 cereal bars. What is the least amount of money that Roxie can spend on cereal bars?

35. At a festival, $\frac{2}{7}$ of the number of girls was equal to $\frac{3}{5}$ of the number of boys. There were 165 fewer boys than girls, how many children were at the festival in all?

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Cumulative Practice
for Chapters 4 to 7

Find the missing term in each pair of equivalent ratios.

1. 7 : 15 = 63 : _____

2. _____ : 13 = 48 : 104

Write each ratio in simplest form.

3. 36 : 90 _____

4. 56 : 91 _____

5. 60 inches : 3 feet

_____

6. 2 pounds : 24 ounces

_____

Express each decimal as a percent.

7. 0.76 _____

8. 1.09 _____

Express each fraction as a percent.

9. $\frac{13}{20}$ _____

10. $\frac{7}{12}$ _____

Express each percent as a decimal.

11. 9% _____

12. 150% _____

Express each percent as a fraction in simplest form.

13. 88% _____

14. 120% _____

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Find the quantity represented by each percent.

15. 45% of 96 quarts

16. 60% of 60 minutes

Evaluate each expression for the given value of the variable.

17. $9x - 29$ if $x = 6$

18. $7y - 10$ if $y = 4$

19. $2(3x + 6) - \frac{5x - 4}{2}$ if $x = 10$

20. $\frac{10 + 4y - 6}{3} + \frac{5y - 4}{3}$ if $y = 5$

Simplify each expression.

21. $9w + 8 - 6w - 3 + 4w$

22. $7 + 8y - 3 + 3y + 5 - 6y$

Expand each expression.

23. $4(6q - 3)$

24. $7(5 + 7y) + 3(y + 1)$

Factor each expression.

25. $12g + 4g + 4$

26. $40 - 10h + 9 - 4h$

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Write an algebraic expression for each of the following.

27. A number is 7 more than the product of 6 and p.

28. The total cost of 2 notebooks if 8 notebooks cost a total of y dollars.

29. Jacob has m nails and twice as many bolts as nails. He buys another 20 nails and 30 bolts. Find the total number of nails and bolts Jacob has now.

30. Anya has $2p$ trading cards. Ben has three times as many trading cards as Anya. Colin has half as many trading cards as Ben. Find the total number of trading cards they have altogether.

31. Jon has y stickers. He uses 20 stickers and divides the remainder equally between his two sisters. Find the number of stickers each sister receives.

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Solve. Show your work.

32. A car traveled a distance of 124 miles in 2.5 hours. Find the speed of the car.

33. Wyatt swims 500 yards in 5 minutes and 15 seconds. What is his swimming speed in yards per minute, to the nearest whole yard?

34. The table shows the rental fees for a concert hall.

First 2 hours	\$180 per hour
Each additional hour	\$115

What is the total rental fee if Mrs. Wu rents the concert hall for 5 hours?

35. $\frac{2}{5}$ of Abel's books are equal to $\frac{4}{7}$ of Bella's books. What is the ratio of Abel's books to Bella's books?

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36. There are 84 students in the Glee Club. There are 12 more boys than girls. What is the ratio of the number of girls to the number of boys?

37. The table shows how much money Jake spent last week.

Expense	Entertainment	Bus fare	School supplies	Food
Amount	$12	$5	$6	?

Jake spent 40% of his money on entertainment and school supplies. How much did he spend on food?

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Cumulative Practice
for Chapters 8 to 11

Represent the solution set of each inequality on a number line.

1. $w > -15$

2. $x \geq 8\frac{1}{2}$

SKIP

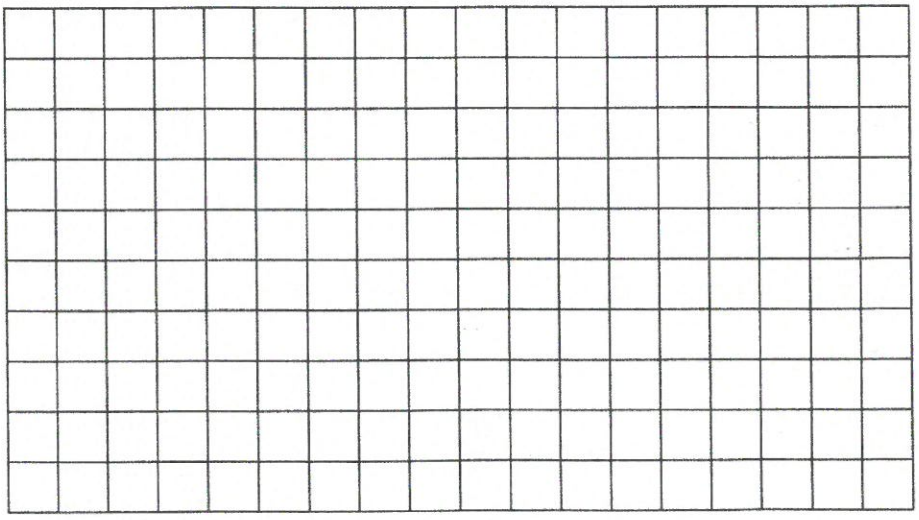
3. $y \leq 2.25$

4. $z < -\frac{1}{3}$

Plot the points on the coordinate plane below and answer each question.

5. **a)** Points R and S are reflections of each other about the y–axis. What are the coordinates of point S if point R is located at $(-4, 1)$. Connect the two points to form a line segment.

b) Point T lies below $\overline{RS}$ and forms a right angle RST. $\overline{RS}$ is the base of triangle RST. The height of triangle RST is 4 units. What are the coordinates of point T?



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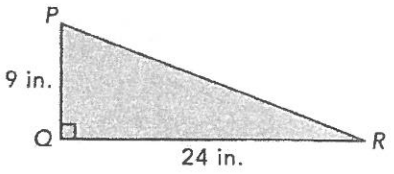
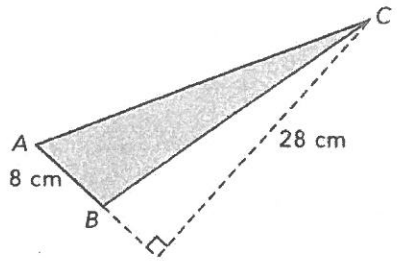
Find the area of each triangle.

6.

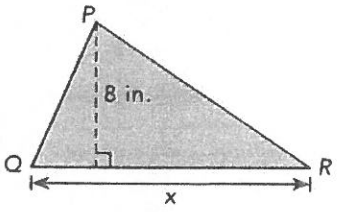


7.

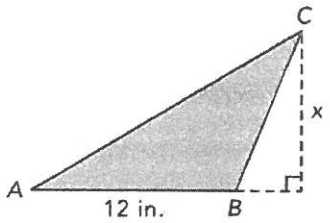


The area of each triangle is 60 square inches. Find the measure of *x*.

8.

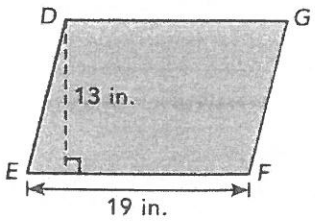


9.

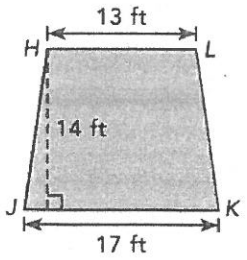


Find the area of each polygon.

10. *DEFG* is a parallelogram.



11. *HJKL* is a trapezoid.



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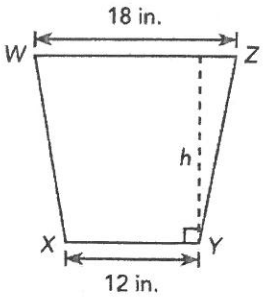
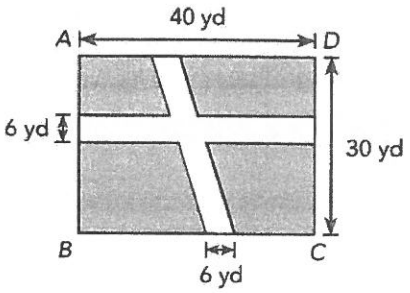
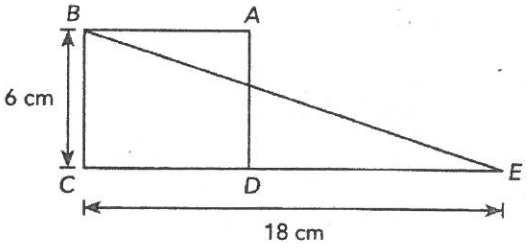
30. The area of trapezoid *WXYZ* is 255 square inches. Find its height *h*.



31. In rectangle *ABCD* shown, *AD* = 40 yards and *CD* = 30 yards. Find the area of the shaded regions.



32. The figure shows rectangle *ABCD* overlapping with triangle *BCE*. The area of triangle *BCE* is 12 square centimeters larger than the area of rectangle *ABCD*. Find the length of $\overline{AB}$.



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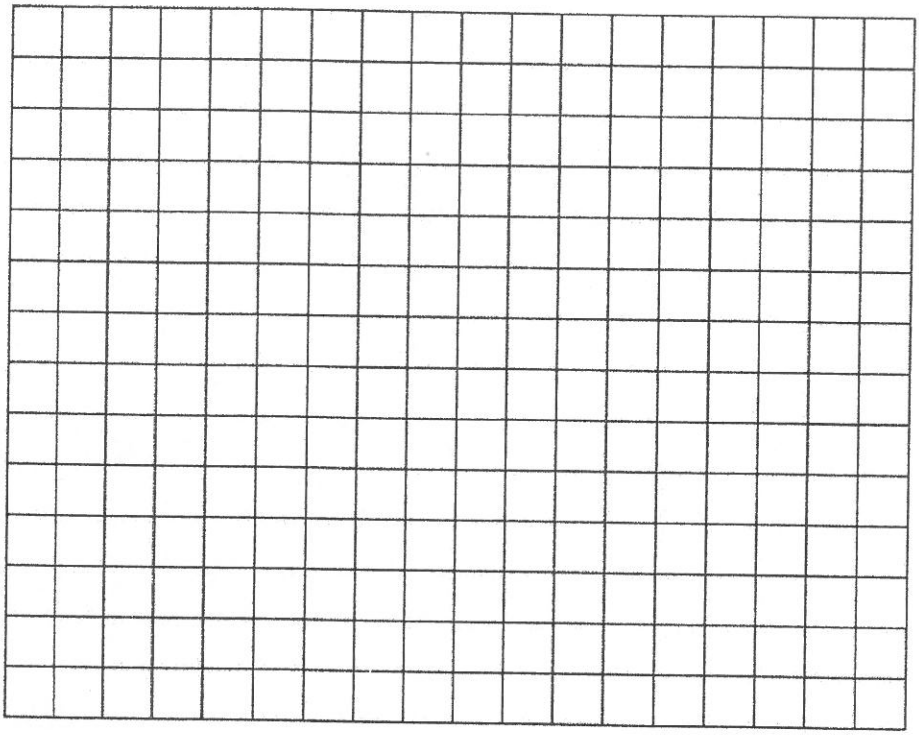
35. Plot points P (2, 5), Q (−3, −3), and R (3, −3) on a coordinate plane.



a) Find the area of triangle PQR.

b) Figure $PQRS$ is a parallelogram. Point S has a positive x-coordinate and the same y-coordinate as point P. Plot point S on the coordinate plane and give its coordinates.

c) Find the area of parallelogram $PQRS$.

d) Triangle TQR is a right triangle, and its area is one-half the area of triangle PQR. Point T is above point Q. Plot point T on the coordinate plane and give its coordinates.

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Solve. Show your work.

10. The data set shows the ages of eight students.
10 yr, 15 yr, 16 yr, 8 yr, 12 yr, 15 yr, 14 yr, 10 yr
Find the mean, and median ages of these eight students.

11. The data set shows the times of ten runners in a race.
56.0 s, 55.5 s, 55.4 s, 55.9 s, 55.7 s, 56.3 s, 56.2 s, 55.9 s, 55.6 s, 56.5 s
Find the mean, and median times of these ten runners.

12. The data set shows the duration of twelve songs, in minutes, on an album.
$4, 3\frac{1}{3}, 4\frac{1}{3}, 2\frac{8}{15}, 5\frac{2}{3}, 3\frac{8}{15}, 2, 6, 1\frac{4}{15}, 5\frac{2}{3}, 5\frac{4}{5}, 5\frac{11}{30}$
Find the mean, and median durations of these twelve songs.

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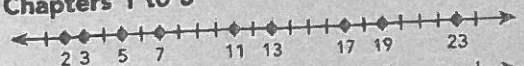
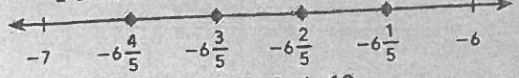
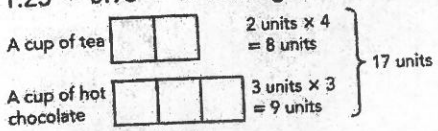
Cumulative Practice for Chapters 1 to 3

1. 

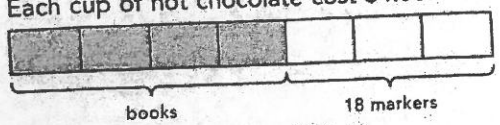
2. 

3. −20, −10, −8, −5, 0, 2, 6, 13
4. 25, 20, 7, 0, −4, −12, −16, −30
5. <
6. >
7. >
8. >
9. >
10. >
11. <
12. <
13. $2 \times 2 \times 2 \times 7$
14. $2 \times 2 \times 3 \times 3 \times 5$
15. 6
16. 12
17. 42
18. 84
19. 196
20. 27,000
21. 18
22. 12
23. 91
24. 7
25. $1\frac{4}{5}$
26. $4\frac{1}{8}$
27. 9.25
28. 7.4
29. $7.5 \div 12 = 0.625$ kilogram
30. $4\frac{1}{2} \div \frac{3}{4} = 6$ casseroles

31. 3 units → 1.8 − 1.23 = 0.57 kilogram
1 unit → 0.57 ÷ 3 = 0.19 kilogram
5 units → 5 × 0.19 = 0.95 kilogram
1.23 − 0.95 = 0.28 kilogram

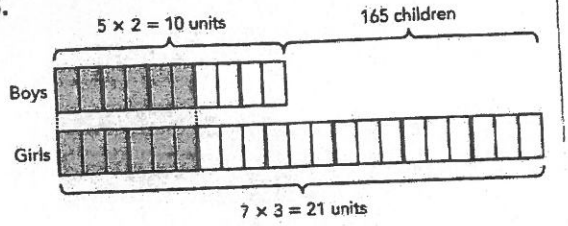
32. 

17 units → $25.50
1 unit → $25.50 ÷ 17 = $1.50
$1.50 × 3 = $4.50
Each cup of hot chocolate cost $4.50.

33. 

3 units → $1.20 × 18 = $21.60
7 units → $7 \times \$\frac{21.60}{3} = \$50.40$
Josie began with $50.40 in her purse.

34. 38 ÷ 4 = 9 R2
9 × $8 + 2 × $2.40 = $76.80
The least amount fo money Roxie can spend on cereal bars is $76.80.

35. 

Difference → 21 − 10 = 11 units
11 units → 165 children
1 unit → 165 ÷ 11 = 15 children
Total → 31 units → 31 × 15
= 465 children
There were 465 children at the festival.

Cumulative Practice for Chapters 4 to 7

1. 135
2. 6
3. 2 : 5
4. 8 : 13
5. 5 : 3
6. 4 : 3
7. 76%
8. 109%
9. 65%
10. $58\frac{1}{3}\%$
11. 0.09
12. 1.5
13. $\frac{22}{25}$
14. $1\frac{1}{5}$
15. 43.2 quarts
16. 36 minutes
17. 25
18. 18
19. 49
20. 15
21. $7w + 5$
22. $9 + 5y$
23. $24q - 12$
24. $38 + 52y$
25. $4(4g + 1)$
26. $7(7 - 2h)$
27. $6p + 7$
28. 8 notebooks → y dollars
2 notebooks → $\frac{y}{4}$ dollars

29. Number of nails = $m + 20$
Number of bolts = $2m + 30$
$(m + 20) + (2m + 30) = 3m + 50$
Jacob has $(3m + 50)$ nails and bolts now.

30. Anya → $2p$
Ben → $3 \times 2p = 6p$
Colin → $6p \div 2 = 3p$
$2p + 6p + 3p = 11p$
They have $11p$ trading cards altogether.

31. $\frac{y - 20}{2}$ stickers
Each sister receives $\frac{y - 20}{2}$ stickers.

32. 124 ÷ 2.5 = 49.6
The speed of the car was 49.6 miles per hour.

33. 5 minutes 15 seconds = 5.25 minutes
500 ÷ 5.25 ≈ 95 yards per minute
His swimming speed is 95 yards per minute, to the nearest whole yard.

34. $2 \times 180 + 3 \times 115 = \$705$
The total rental fee is $705.

35. $\frac{2}{5} : \frac{4}{7} = \frac{4}{10} : \frac{4}{7}$
Abel : Bella = 10 : 7
The ratio is 10 : 7.

36. Number of girls = (84 − 12) ÷ 2 = 36
Number of boys → 36 + 12 = 48
36 : 48 = 3 : 4
The ratio is 3 : 4.

37. 40% → $12 + $6 = $18
100% → $100 \times \$\frac{18}{40} = \$45$
Food → $45 − ($12 + $5 + $6)
= $22

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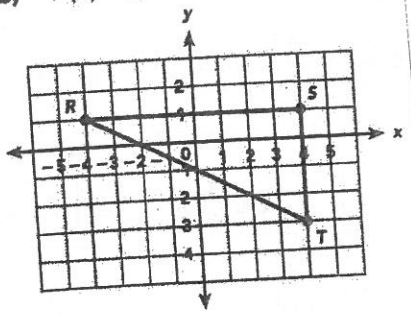
Cumulative Practice for Chapters 8 to 11

5. a) $S(4, 1)$
b) $T(4, -3)$



6. $\frac{1}{2} \cdot 24 \cdot 9 = 108$ square inches

7. $\frac{1}{2} \cdot 8 \cdot 28 = 112$ square centimeters

8. $\frac{60 \cdot 2}{8} = 15$ inches

9. $\frac{60 \cdot 2}{12} = 10$ inches

10. $19 \cdot 13 = 247$ square inches

11. $\frac{1}{2} \cdot 14(13 + 17) = 210$ square feet

30. $\frac{1}{2} \cdot h(12 + 18) = 255$ in.^{2}

$30h = 255 \cdot 2$

$h = 510 \div 30$

$= 17$ in.

The height of trapezoid $WXYZ$ is 17 inches

31. Length of the shaded regions
$= 40 - 6 = 34$ yd
Width of the shaded regions
$= 30 - 6 = 24$ yd
Area of the shaded regions
$= 34 \cdot 24 = 816$ yd^2
The area of the shaded regions is 816 square yards.

32. Area of triangle BCE
$= \frac{1}{2} \cdot 18 \cdot 6 = 54$ cm^2
Area of rectangle $ABCD$
$= 54 - 12 = 42$ cm^2
$AB = 42 \div 6 = 7$ centimeters

10. Arrange the ages from least to greatest:
8, 10, 10, 12, 14, 15, 15, 16
Mean

$$= \frac{8 + 10 + 10 + 12 + 14 + 15 + 15 + 16}{8}$$

$$= \frac{100}{8}$$

$= 12.5$
The mean age is 12.5 years.

Median $= \frac{12 + 14}{2} = \frac{26}{2} = 13$
The median age is the mean of the two middle values, which is 23 years.

11. Arrange the times from the least to the greatest:
55.4, 55.5, 55.6, 55.7, 55.9, 55.9, 56.0, 56.2, 56.3, 56.5
Mean
$= (55.4 + 55.5 + 55.6 + 55.7 + 2 \cdot 55.9 + 56.0 + 56.2 + 56.3 + 56.5) \div 10$

$$= \frac{559}{10}$$

$= 55.9$ s
The median time is the middle value, which is 55.9 seconds.

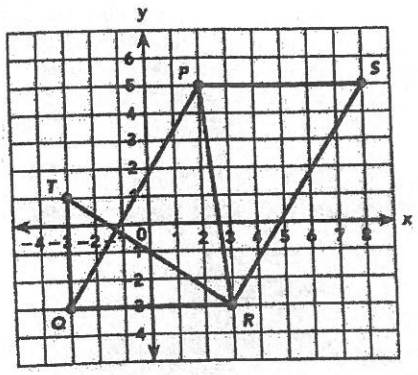
12. Arrange the durations of the songs from the least to the greatest:
$1\frac{4}{15}, 2, 2\frac{8}{15}, 3\frac{1}{3}, 3\frac{8}{15}, 4, 4\frac{1}{3}, 5\frac{11}{30}, 5\frac{2}{3}, 5\frac{2}{3}, 5\frac{4}{5}, 6$
Mean

$$= \left(1\frac{4}{15} + 2 + 2\frac{8}{15} + 3\frac{1}{3} + 3\frac{8}{15} + 4 + 4\frac{1}{3} + 5\frac{11}{30} + 5\frac{2}{3} + 5\frac{2}{3} + 5\frac{4}{5} + 6\right) \div 12$$

$= 49\frac{1}{2} \div 12 = 4\frac{1}{8}$ min

Median $= \left(4 + 4\frac{1}{3}\right) \div 2 = 4\frac{1}{6}$ min
The median length is the mean of the two middle values, which is $4\frac{1}{6}$ minutes.

35.



a) Base = 6 units;
height = 8 units
Area of triangle PQR
$= \frac{1}{2} \cdot 6 \cdot 8 = 24$ square units

b) The coordinates of point S are (8, 5).

c) Area of parallelogram $PQRS$
$= 6 \cdot 8 = 48$ square units

d) Area of triangle TQR
$= 24 \div 2 = 12$ square units
So, $TQ = (12 \cdot 2) \div 6$
$= 4$ units
Point T has the same x-coordinate as point Q and is 4 units above point Q.
So, the coordinates of point T are $(-3, 1)$.