2nd Semester Exam Study Guide

Spring 2018

Name: Key (Horton) Period: _____

Multi-Part Lesson 1-3: Powers of 10

Part D

PAGES 62–65

Write each product using an exponent.

1. $4 \times 4 \times 4 \times 4$ 4^4
2. $10 \times 10 \times 10$ 10^3
3. 14×14 14^2
4. $3 \times 3 \times 3 \times 3$ 3^4
5. $2 \times 2 \times 2$ 2^3
6. $6 \times 6 \times 6 \times 6 \times 6$ 6^5
7. $8.2 \times 8.2 \times 8.2$ 8.2^3
8. $7 \times 7 \times 7 \times 7 \times 7 \times 7$ 7^6
9. $9.5 \times 9.5 \times 9.5$ 9.5^3

Write each power as a product of the same factor. Then find the value.

10. 9^4 6561
11. 2^3 8
12. 3^5 243
13. 4^3 64
14. 6^5 7776
15. 5^4 625
16. 8.5^3 614.125
17. 1.3^2 1.69

18. **FOOD** The number of Calories in a small banana can be written as 2^7. What whole number does 2^7 represent?

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$

Multi-Part Lesson 5-1: Write and Evaluate Expressions

PART E

PAGES 270–273

Find the value of each expression.

1) $12 + 10 - 5 - 6$ 11
2) $2 \times 3 + 9 \times 2$ 24
3) $8 + 12 \times 4 \div 8$ 14
4) $54 \div (8 - 5)$ 18
5) $4^2 + 3^3$ 43
6) $(11 - 7) \times 3 - 5$ 7
7) $25 - 9 + 4$ 20
8) $100 \div 10 \times 2$ 20
9) 3×4^3 192
10) $11 + 4 \times (12 - 7)$ 31
11) $6^2 - 7 \times 4$ 8
12) $12 + 5^2 - 9$ 28

PART F

PAGES 274–278

Evaluate each expression if $m = 2$ and $n = 4$.

1. $m + m$ 4
2. $n - m$ 2
3. mn 8
4. $3m + 5$ 11
5. $2n + 2m$ 12
6. $m \cdot 0$ 0
7. $64 \div n$ 16
8. $12 - m$ 10
9. $5n \div m$ 10
10. $6mn$ 48
11. $4n - 3$ 13
12. $n \div m + 8$ 10

Evaluate each expression if $a = 3$, $b = 4$, and $c = 12$.

13. $a + b$ 7
14. $c - a$ 9
15. $a + b + c$ 19
16. $b - a$ 1
17. $c - a \cdot b$ 0
18. $a + 2 \cdot b$ 11
19. $b + c \div 2$ 10
20. ab 12

Name : _____ Score : 2

Teacher : _____ Date : _____

Order of Operations

1) $4 \times (13 \times 10 + 2^2) + 9$

P: $4 \times (13 \times 10 + 4) + 9$

E: $4 \cdot (130 + 4) + 9$

MD: $4 \cdot 134 + 9$

AS: $536 + 9$

545

2) $(12 + 44 - 4^2) \div (16 - 6)$

P: $(12 + 44 - 16) \div 10$

E:

MD: $40 \div 10$

AS: 4

3) $(14 + 27 - 3^2) \div (19 - 3)$

P: $(14 + 27 - 9) \div 16$

E: $32 \div 16$

MD:

AS: 2

4) $(11 + 30 - 5) \div 12 + 7^2$

P: $(41 - 5) \div 12 + 7^2$

E: $36 \div 12 + 7^2$

MD: $36 \div 12 + 49$

AS: $3 + 49$

52

5) $(15 + 15 - 6) \div 6 - 6^2$

P:

E: $24 \div 6 - 36$

MD: $4 - 36$

AS: -32

6) $3 \times (11 \times 9 + 2^2) - 7$

P: $3 \times (11 \cdot 9 + 4) - 7$

E: $3 \times (99 + 4) - 7$

MD: $3 \cdot 103 - 7$

AS: $309 - 7$

302

7) $(20 - 4) \times (12 - 4) + 3^2$

P: $16 \times 8 + 3^2$

E: $16 \times 8 + 9$

MD: $128 + 9$

AS: 137

8) $(2 + 4)^2 + (15 + 10 \div 2)$

P: $6^2 + (15 + 5)$

E: $6^2 + 20$

MD:

AS: $36 + 20$

56

9) $(16 - 4) \times (9 - 2) + 9^2$

P: $12 \times 7 + 9^2$

E: $12 \times 7 + 81$

MD: $84 + 81$

AS: 165

10) $(7 + 5)^2 + (12 + 20 \div 4)$

P: $12^2 + (12 + 5)$

E: $12^2 + 17$

MD:

AS: $144 + 17$

161

Name: Study Guide. Period: _____

Write an algebraic expression to translate each written phrase or real-life scenario.

1. the sum (+) of 4 and a number y ___4 + y___
2. 6 less than (switch phrase) a number x ___x - 6___
3. the quotient (÷) of a number m and 16 ___m ÷ 16 16)m $\frac{m}{16}$___
4. the product (x) of a number t and 9 ___t · 9 9t___
5. I want to double (x2) my profits from last year. ___P x 2___
6. The number of apples split evenly between 5 people. ___a ÷ 5___
7. Liz has 10 more cans of soda than Peter. ___C + 10___
8. Five years less than (switch phrase) Mary's age ___M - 5___
9. Bowl three games and pay for $2.00 shoe rental ___3g + $2.00___
10. Mei paid $8.00 to enter the carnival area and then bought 50 game tickets. ___$8.00 + 50t___

RATIOS, RATES, UNIT RATES AND RATIO TABLES STUDY GUIDE

Name:_____ Period:_____ Date:_____

I. Write each scenario as a ratio using labels. Remember to write each ratio in simplest form.

a) Tyson's math class has 12 boys and 8 girls. Write the ratio of girls to boys.

$\frac{8 \text{ girls} \div 4}{12 \text{ boys} \div 4} = \frac{2 \text{ girls}}{3 \text{ boys}}$

b) At a bake sale, 15 cookies and 40 brownies were sold. Write the ratio of cookies sold to brownies sold.

$\frac{15 \text{ cookies} \div 5}{40 \text{ brownies} \div 5} = \frac{3 \text{ cookies}}{8 \text{ brownies}}$

c) The jewelry store is having a sale on 25 emerald rings and 15 ruby rings. Write the ratio of ruby rings to emerald rings.

$\frac{15 \text{ ruby} \div 5}{25 \text{ emerald} \div 5} = \frac{3 \text{ ruby}}{5 \text{ emerald}}$

d) In a bouquet of flowers, there are 6 roses, 5 carnations, 3 lilies, and 7 daisies. Write the ratio of roses to total flowers in the bouquet.

$\frac{6 \text{ roses} \div 3}{21 \text{ total} \div 3} = \frac{2 \text{ roses}}{7 \text{ total flowers}}$

e) Of the 24 sandwiches on the table, 9 of them were burgers. Write the ratio of burgers to total sandwiches.

$\frac{9 \text{ burgers} \div 3}{24 \text{ total} \div 3} = \frac{3 \text{ burger}}{8 \text{ total sandwiches}}$

Reduce!

Ratios and Rates

Express each ratio as a fraction in the simplest form.

1) 48 cups to 54 cups $\frac{48 \div 6}{54} = \frac{8 \text{ cups}}{9 \text{ cups}}$

2) 25 blue cars out of 40 cars $\frac{25 \div 5}{40} = \frac{5 \text{ blue}}{8 \text{ cars}}$

3) 12 quarts to 16 quarts $\frac{12 \div 4}{16} = \frac{3 \text{ quarts}}{4 \text{ quarts}}$

4) 12 gallons to 14 gallons $\frac{12 \div 2}{14} = \frac{6 \text{ gallo}}{7 \text{ gallo}}$

5) 21 dimes to 28 dimes $\frac{21 \div 7}{28} = \frac{3 \text{ dimes}}{4 \text{ dimes}}$

6) 5 pennies to 45 pennies $\frac{5 \div 5}{45} = \frac{1 \text{ penni}}{9 \text{ penni}}$

7) 7 beetles out of 56 insects $\frac{7 \text{ beetles} \div 7}{56 \text{ insects}} = \frac{1 \text{ beetle}}{8 \text{ insects}}$

8) 30 miles out of 36 miles $\frac{30 \text{ miles} \div 6}{36 \text{ miles}} = \frac{5 \text{ miles}}{6 \text{ miles}}$

II. Write each phrase as a Rate (first) and then determine Unit Rate (second).
** Remember Unit Rate always has a denominator of 1 **

a) $42 for 7 books — Rate: $\frac{\$42}{7 \text{ books}}$ $\xrightarrow{\div 7}$ Unit Rate: $\frac{\$6}{1 \text{ book}}$

b) $6 for 8 packs of gum — $\frac{\$6}{8 \text{ packs}} \xrightarrow{\div 8} \frac{\$0.75}{1 \text{ pack}}$

c) $216 for 18 hours of work — $\frac{\$216}{18 \text{ hours}} \xrightarrow{\div 18} \frac{\$12}{1 \text{ hour}}$

d) 120 miles in 8 weeks — $\frac{120 \text{ miles}}{8 \text{ weeks}} \xrightarrow{\div 8} \frac{15 \text{ miles}}{1 \text{ week}}$

e) 79.8 miles on 3 gallons of gas — $\frac{79.8 \text{ miles}}{3 \text{ gallons}} \xrightarrow{\div 3} \frac{26.6 \text{ miles}}{1 \text{ gallon}}$

III. Use Rates & Unit Rates to determine which is the better deal. Circle your answer !!
** Remember to round to the nearest hundredth if you have a decimal **

a) $12 for 3 paperback books; $28 for 7 paperback books
$\frac{\$12}{3 \text{ books}} = \frac{\$4}{1 \text{ book}} = \frac{\$28}{7 \text{ books}} = \frac{\$4}{1 \text{ book}}$ same deal *

b) 25 gumballs for $3.50; 30 gumballs for $4.50
$\frac{\$3.50}{25 \text{ gum}} = \frac{\$0.14}{1 \text{ ball}}$ * better deal $\frac{\$4.50}{30 \text{ gum}} = \frac{\$0.15}{1 \text{ g}}$

c) 96 words typed in 3 minutes; 160 words typed in 5 minutes
$\frac{96 \text{ words}}{3 \text{ minutes}} = \frac{32 \text{ words}}{1 \text{ minute}}$ $\frac{160 \text{ words}}{5 \text{ minutes}} = \frac{32 \text{ words}}{1 \text{ minute}}$ * same deal

d) $3 for 6 bagels; $9 for 24 bagels
$\frac{\$3}{6 \text{ bagels}} = \frac{\$0.50}{1 \text{ bagel}}$ $\frac{\$9}{24 \text{ bagels}} = \frac{\$0.38}{1 \text{ bagel}}$ * better deal

e) 288 miles on 12 gallons of fuel; 240 miles on 10 gallons of fuel
$\frac{288 \text{ miles}}{12 \text{ gallons}} = \frac{24 \text{ miles}}{1 \text{ gallon}}$ $\frac{240 \text{ miles}}{10 \text{ gallons}} = \frac{24 \text{ miles}}{1 \text{ gallon}}$ * same deal

f) $22 for 2 new-release CDs; $40 for 4 new-release CDs
$\frac{\$22}{2 \text{ CDs}} = \frac{\$11}{1 \text{ CD}}$ $\frac{\$40}{4 \text{ CDs}} = \frac{\$10}{1 \text{ CD}}$ * better deal

g) $24 saved after 3 weeks; $52 saved after 7 weeks
$\frac{\$24}{3 \text{ weeks}} = \frac{\$8}{1 \text{ week}}$ * better deal $\frac{\$52}{7 \text{ weeks}} = \frac{7.43}{1 \text{ week}}$

L1 - Solving Percent Problems using Proportions Worksheet

Name: _____

Date: _____ Section: _____

REMEMBER:

"OF" number is always behind the word of

"%" number is the number with the percent sign

"IS" number will be in front of the word is or behind the word is

use this →

PROPORTION

$$\frac{is}{of} = \frac{\%}{100}$$

!!

Write a proportion and then solve it for each problem. Be sure to show all the steps for solving a proportion. If necessary, round answers to the nearest tenth.

1. What number is 70% of 45?

$\frac{X}{45} = \frac{70}{100}$ ← %

$100x = 45 \cdot 70$

$\frac{100x}{100} = \frac{3150}{100}$

$x = 31.50$

1. $X = 31.50$

2. 23% of 75 is what number?

2. $X = 17.25$

3. 45 is what percent of 90?

3. $X = 50\%$

4. What percent of 77 is 7?

$\frac{7}{77} = \frac{x}{100}$

$\frac{77x}{77} = \frac{700}{77}$

$x = 9.09\%$

4. $X = 9.09\%$

5. 15 is 25% of what number?

$\frac{15}{x} = \frac{25}{100}$

$25x = 15 \cdot 100$

$\frac{25x}{25} = \frac{1500}{25}$

$x = 60$

5. $X = 60$

6. 18% of what number is 43?

$\frac{43}{x} = \frac{18}{100}$

$43 \cdot 100 = 18x$

$\frac{4300}{18} = \frac{18x}{18}$

$238.\overline{8} = x$

6. $X = 238.\overline{8}$

L1 - Solving Percent Problems using Proportions Worksheet

Name: _____

Date: _____ Section: _____

REMEMBER:

"OF" number is always behind the word of

"%" number is the number with the percent sign

"IS" number will be in front of the word is
or behind the word is

use this →

PROPORTION

$$\frac{is}{of} = \frac{\%}{100}$$

!!

Write a proportion and then solve it for each problem. Be sure to show all the steps for solving a proportion. If necessary, round answers to the nearest tenth.

1. What number (X) is 70% of 45?

$$\frac{X}{45} = \frac{70}{100} \quad \text{(is / of; \% / 100)}$$

$100X = 45 \cdot 70$

$\frac{100X}{100} = \frac{3150}{100}$

$X = 31.50$

1. $X = 31.50$

2. 23% of 75 is what number?

2. $X = 17.25$

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$$\frac{7}{77} = \frac{X}{100}$$

$\frac{77X}{77} = \frac{700}{77}$

$X = 9.09\%$

4. $X = 9.09\%$

5. 15 is 25% of what number?

$$\frac{15}{X} = \frac{25}{100}$$

$25X = 15 \cdot 100$

$\frac{25X}{25} = \frac{1500}{25}$

$X = 60$

5. $X = 60$

6. 18% of what number is 43?

$$\frac{43}{X} = \frac{18}{100}$$

$43 \cdot 100 = 18X$

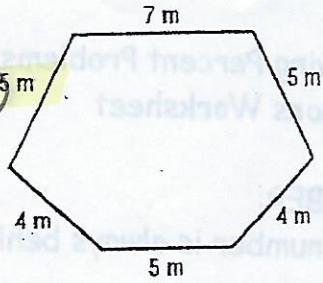
$\frac{4300}{18} = \frac{18X}{18}$

$238.8\overline{} = X$

6. $X = 238.8\overline{}$

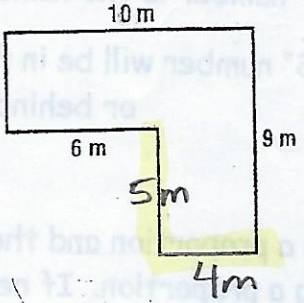
1. **What is the perimeter of each figure?**

A. 18 m
B. 23 m
C. 25 m
D. 30 m



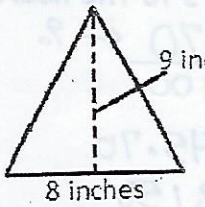
2.

F. 29 m
G. 33 m
H. 34 m
I. 38 m



Watch out for missing sides!!

3. Find the area, in square inches, of the triangle below.



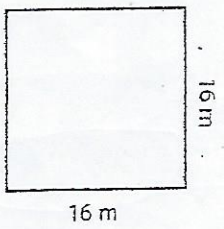
$A = \frac{bh}{2}$

$A = \frac{8 \cdot 9}{2} = \frac{72}{2} = 36 \text{ in}^2$

A) 17 inches^2 B) 26 inches^2 C) 36 inches^2 D) 72 inches^2

Find the area of each figure below.

5.

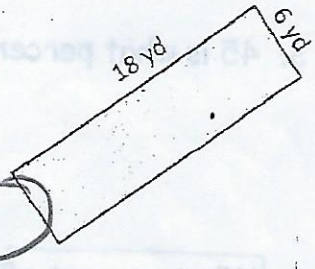


$A = l \times w$

$A = 16 \cdot 16$

$A = 256 \text{ m}^2$

6.

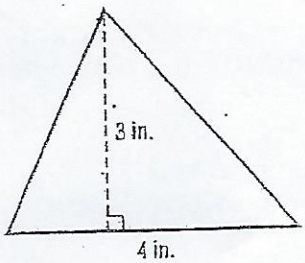


$A = l \times w$

$A = 18 \cdot 6$

$A = 108 \text{ yd}^2$

7.



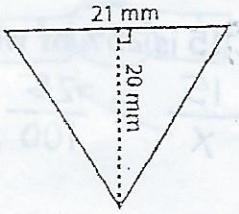
$A = \frac{bh}{2}$

$A = \frac{4 \cdot 3}{2}$

$A = \frac{12}{2}$

$A = 6 \text{ in}^2$

8.



$A = \frac{bh}{2}$

$A = \frac{21 \cdot 20}{2}$

$A = \frac{420}{2}$

$A = 210 \text{ mm}^2$

1. Ryan earned money babysitting. He earned ~~$40~~, ~~$40~~, ~~$51~~, ~~$32~~, and $22. Find the mean amount he earned.

$\$40 + \$40 + \$51 + \$32 + \$22 = \frac{185}{5} = \$37$ mean

2. Find the mean of this set of data. ~~23~~, ~~2~~, ~~21~~, ~~23~~, ~~19~~, ~~18~~, ~~20~~

Identify the outlier in the data set.

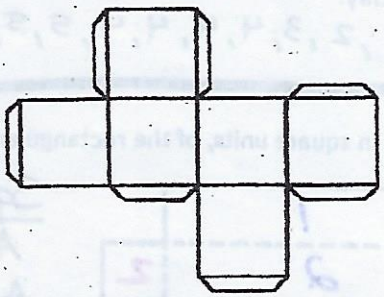
$23 + 2 + 21 + 23 + 19 + 18 + 20 = \frac{126}{7} = 18$ mean

3. Yeaphana measured the weight of 10 adults, in pounds: ~~160~~, ~~140~~, ~~175~~, ~~141~~, ~~138~~, ~~155~~, 221, ~~170~~, ~~150~~, and ~~188~~. Find the median weight.

138, 140, 141, 150, 155, 160, 170, 175, 188, 221

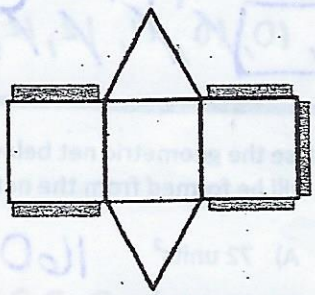
$155 + 160 = 315 \div 2 = 157.5$ median

1. What three dimensional shape can be made using the net below?



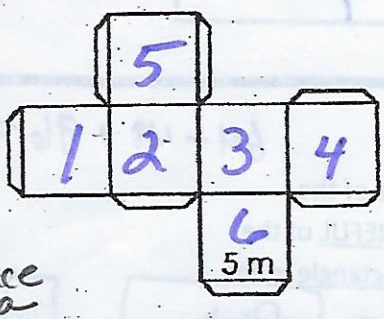
Cube

2. What three dimensional shape can be made using the net below?



triangular prism

3. What is the surface area of the shape made from the net below?

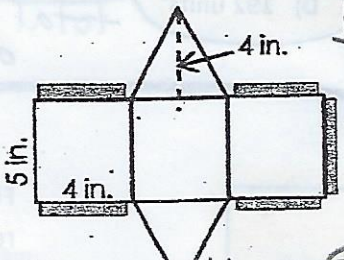


$5 \times 5 = 25\ m^2$

$25\ m^2 \times 6 = 150\ m^2$ total surface area

150 m^2 total surface area

4. What is the surface area of the shape made from the net below?

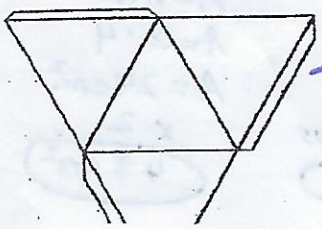


Rectangles: $A = l \times w$, $A = 5 \cdot 4$, $A = 20\ in^2$, $\times 3$, $60\ in^2$

Triangles: $A = \frac{bh}{2}$, $A = \frac{4 \cdot 4}{2}$, $A = \frac{16}{2}$, $A = 8\ in^2$, $\times 2$, $16\ in^2$

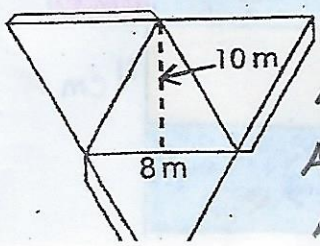
$60\ in^2 + 16\ in^2 = 72\ in^2$

5. What three dimensional shape can be made using the net below?



triangular pyramid

6. What is the surface area of the shape made from the net below?

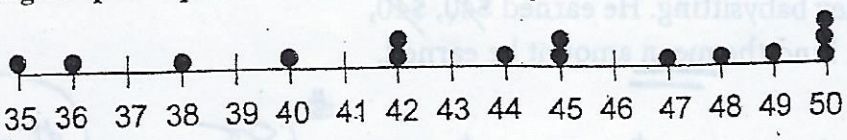


$A = \frac{bh}{2}$, $A = \frac{8 \cdot 10}{2}$, $A = \frac{80}{2}$, $A = 40\ m^2$

$40\ m^2 \times 4 = 160\ m^2$ total surface area

10

The following dot plot represents scores on a math project in Mr. Jones' Geometry class.



1. How many data points are in this dot plot?

15 data points

2. Determine the mean of the data.

35 + 36 + 38 + 40 + 42 + 42 + 44 + 45 + 45 + 47 + 48 + 49 + 50 + 50 + 50

661 ÷ 15 = 44.06 mean

3. Determine the median of the data.

45 median

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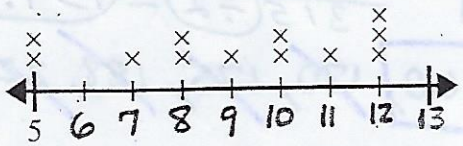
4) The line plot below shows the distance students lived from the school (in miles).

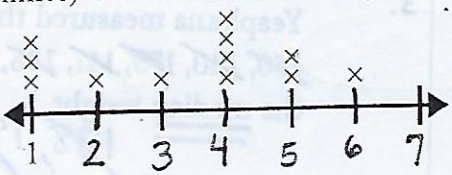


Find the median distance students live from the school.

5, 5, 7, 8, 8, 9, 10, 10, 11, 12, 12, 12

9 + 10 = 19 ÷ 2 = 9.5 median

3) The line plot below shows the distance (in miles) Olivia walked each day.



Fine the average (mean) distance Olivia walked each day.

1, 1, 1, 2, 3, 4, 4, 4, 4, 5, 5, 6 = 40/12 = 3.3 mean

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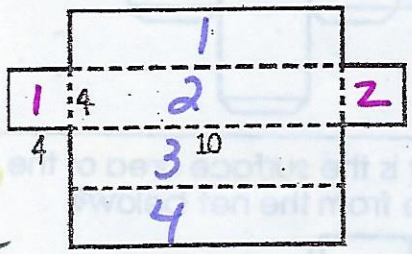
5 Use the geometric net below to find the surface area, in square units, of the rectangular prism that will be formed from the net.

A) 72 units²
B) 96 units²
C) 160 units²
D) 192 units²

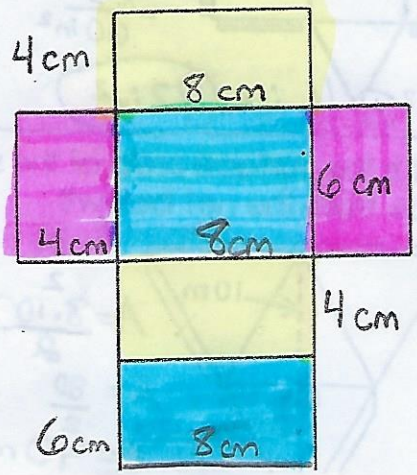


Rectangles
A = l x w
A = 10 · 4
A = 40 units²
x 4
160 units²

160 units² + 32 units² = 192 units² total surface area

Squares
A = l x w
A = 4 · 4
A = 16 units²
x 2
32 units²

6



Find the total surface area of the rectangular prism. BE CAREFUL of the measurements of each rectangle in the figure!!!

Yellow Rectangle
A = l x w.
A = 8 · 4
A = 32 cm²
x 2 yellows
64 cm²

Pink Rectangle
A = l x w
A = 6 · 4
A = 24 cm²
x 2
48 cm²

Blue Rectangle
A = l x w
A = 8 · 6
A = 48 cm²
x 2
96 cm²

64 + 48 + 96 = 208 cm² total surface area

Determine which number is a solution of the inequality.

1) $9 - h > 2$; 6, X, X

$9-6>2$, $3>2$, yes | $9-7>2$, $2 \not> 2$, no | $9-8>2$, $1 \not> 2$, no

2) $32 - n \leq 17$; X, X, 15

$32-13 \leq 17$, $19 \not\leq 17$, no | $32-14 \leq 17$, $18 \not\leq 17$, no | $32-15 \leq 17$, $17 \leq 17$, yes

3) $16 + j \geq 29$; 13, X, X

$16+12 \geq 29$, $28 \not\geq 29$, no | $16+11 \geq 29$, $27 \not\geq 29$, no | $16+13 \geq 29$, $29 \geq 29$, yes!

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Is the given value a solution of the inequality?

4) $t + 6 > 40$; $t = 35$

$35+6>40$, $41>40$, yes!

5) $16 + m > 40$; $m = 16$

$16+16>40$, $32 \not> 40$, no!

6) $9x \geq 80$; $x = 9$

$9 \cdot 9 \geq 80$, $81 \geq 80$, yes!

Write an inequality for each sentence.

7) Their profit was no more than \$86.

$x \leq \$86$

8) The number of SGA members is at least 12.

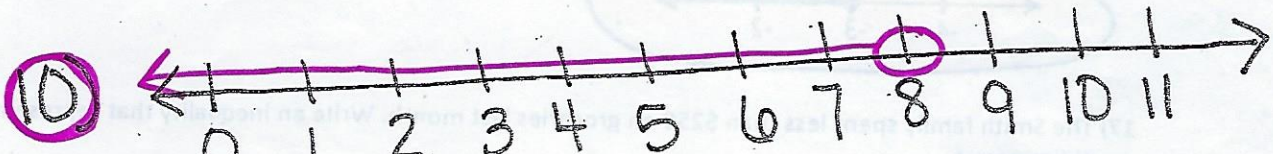
$x \geq 12$ members

9) The large dog show is for dogs that weigh 100 pounds or more.

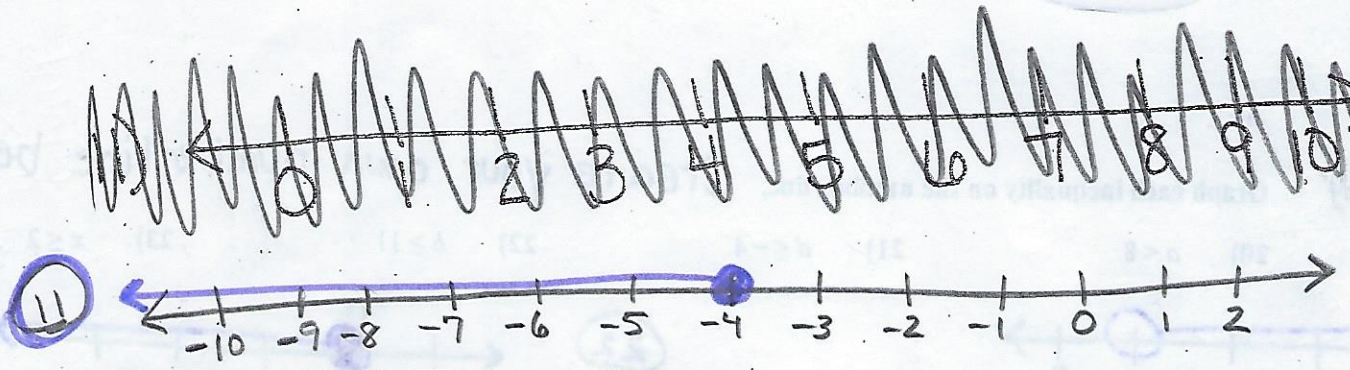
$x \geq 100$ pounds

Graph each inequality on the number line.

10) $a < 8$



11) $d \leq -4$



Write an inequality for each sentence.

7. Swim practice will be no more than 35 laps. $x \leq 35$ laps
8. Kevin ran for less than 5 miles. $x < 5$ miles
9. You cannot spend more than 50 dollars. $\$ \leq \$50$
10. The maximum occupancy must be less than 437 people. $x < 437$ people
11. More than 800 fans attended the opening soccer game. $x > 800$ fans

Determine which number is a solution of the inequality. SHOW ALL YOUR WORK!

12

1) $18 + a > 21$; 2 ~~3~~ 4

$18+2>21$
$20 \not> 21$
no

$18+3>21$
$21>21$
no

$18+4>21$
$22>21$
yes

2) $24 - x \leq 19$; ~~4~~ 5

$24-5 \leq 19$
$19 \leq 19$

3) $7 + r \geq 18$; 11 ~~12~~

$7+11 \geq 18$
$18 \geq 18$

Is the given value a solution of the inequality?

7) $2 + s \geq 10$; $s = 7$

$2+7 \geq 10$
$9 \not\geq 10$ no!

8) $14 - r < 9$; $r = 6$ Yes

$14-6<9$
$8<9$ Yes!

9) $j - 11 \geq 20$; $j = 32$ Yes

$32-11 \geq 20$
$21 \geq 20$ Yes

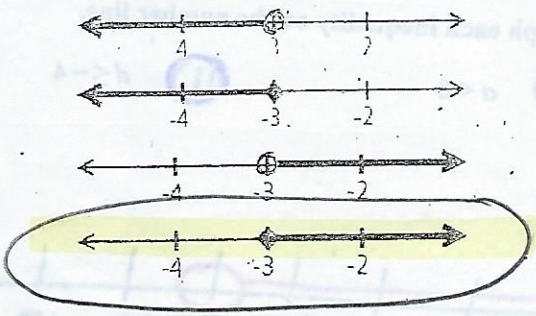
14) Select the number below that makes the inequality true. $x - 5 > 27$

A) 30 B) 31 C) 32 D) 33

15) Given the set {4, 5, 6, 7, 8}, which number(s) make this inequality true? $x + 4 \geq 10$

A) {4, 5} B) {4, 5, 6} C) {5, 6, 7} D) {6, 7, 8}

16) Graph: $x \geq -3$



17) The Smith family spent less than $250 on groceries last month. Write an inequality that represents this amount.

A) $x < 250$ B) $x \leq 250$ C) $x > 250$ D) $x \geq 250$

Graph each inequality on the number line. Create your own number line bel

20) $a < 8$ 21) $d \leq -4$ 22) $b \geq 11$ 23) $x \leq 2$

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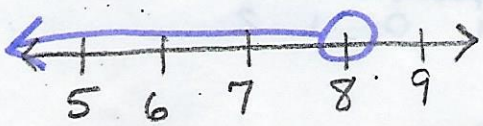

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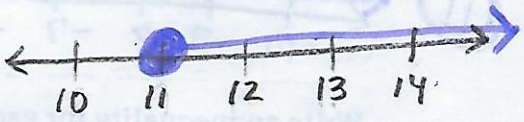

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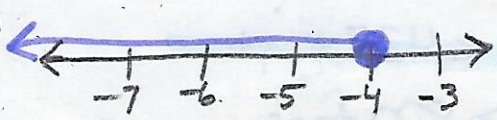

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