

Grade 7 – Word Problems and Geometry Review

1. Percent Change

- (a) If the cost of a 35 EU radio increases 15%, what is the new price?
- (b) If the cost of a radio increases from 35 EU to 50EU, what % increase is that?
- (c) If a balloon grows by 30%, then shrinks 30%, is it bigger, smaller, or the same as the original size? (Hint: use any starting size you wish)

2. Transformations

- (a) Draw points $A = (-4, 4)$ $B = (-5, 8)$ $C = (-2, 8)$ $D = (-2, 4)$ and connect them to make a quadrilateral. Label this shape S.
- (b) Is shape S a rectangle, trapezoid, parallelogram, or none of these?
- (c) By dividing it into a rectangle and a triangle, calculate the area of shape S.
- (d) Reflect shape S through the Y-axis. Label the new shape T.
- (e) Rotate shape S 90 degrees counter-clockwise with D as the center - label this shape U.
- (f) After expanding shape T by a scale factor of 4, what is the new area?

3. Polygons

- (a) A triangle contains a 90 degree angle. The other 2 angles are unknown, but one of them is twice as big as the other (e.g. x and $2x$). Find the size of the smallest angle.
- (b) Draw a **pentagon** whose angles are **80 , 100 , x , $x+20$, and $2x + 40$** .
 - Find out what the total of all the angles must be.
 - Write an equation, solve it, and find the measurements of all 5 angles.
- (c) For a regular decagon, calculate:
 - The total of all the exterior angles
 - The size of one exterior angle.
- (c) If a polygon has **exterior angles** measuring 12 degrees each, how many sides does the polygon have?

4. Proportions

- (a) To make a party drink, cola and orange juice and milk are mixed in a ratio of 5:2:1 . Calculate the amount of each ingredient needed to make 10 liters of party drink. Give your answers in milliliters.
- (b) If milk costs 65 cents per liter
 - calculate the cost of 7.5 liters of milk.
 - how many **whole liter milk carton** can you buy for 50 EU ?

5. Formulas

Given that the formula for the area of a trapezoid is: $A = \frac{(B+T)}{2} \times H$

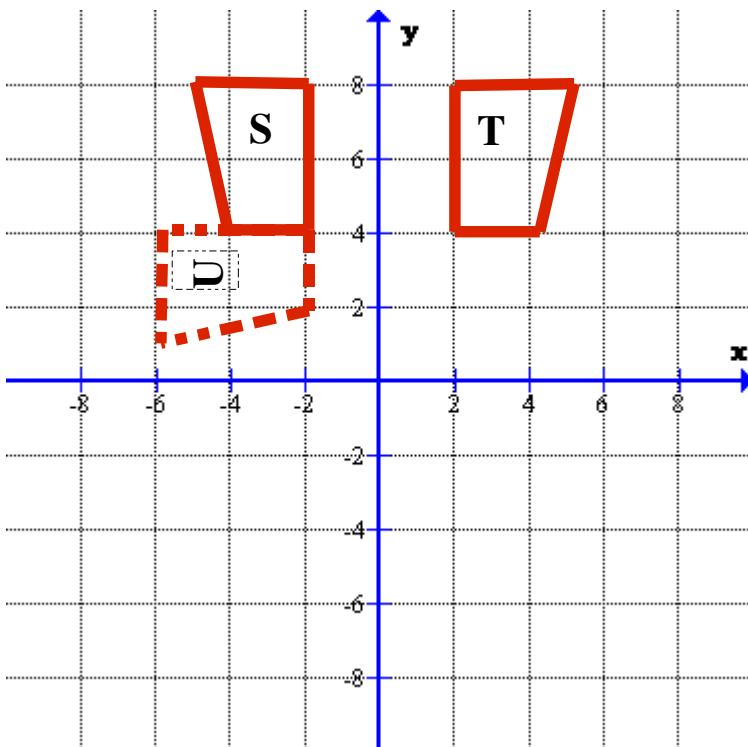
where A = area, B = bottom, T = top, H = height

- (a) Calculate A when $B = 5.5$, $T = 3.5$, and $H = 4.5$
- (b) Calculate H when $A = 40$, $B = 12$, and $T = 4$
- (c) Calculate B when $T = 16$, $H = 4.5$, and $A = 63$
- (d) Memorize the formulas on the next page. Test yourself by folding the page in the middle, reading the description, thinking of the formula, and checking the answer.

Area of a Rectangle	$Area = base \times height$ or $Area = width \times length$
Area of a Triangle	$Area = \frac{1}{2}(base \times height)$
Degrees in a polygon	$Total\ Degrees = (sides - 2) \times 180$
Angles in a regular polygon	$Total\ Degrees = \frac{(sides - 2) \times 180}{sides}$
Exterior angles in a regular polygon	$Total\ Degrees = \frac{360}{sides}$
Increasing by p%	$new\ price = old\ price \times (1 + \frac{p}{100})$
Calculating a percent	$percent = \frac{part}{whole} \times 100$

Answers to Word Problems review:

1a $35 \times 1.15 = 40.25$	1b $50 - 35 = 15$ EU increase $\frac{15}{35} = 43$ (nearest percent)	1c Say diameter = 10 cm $10 \times 1.30 = 13$ cm $13 \times 0.70 = 9.1$ cm So it is smaller than original
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Area of S

Draw a line from

$(-4, 4)$ to $(-4, 8)$

Triangle = $\frac{1}{2}(4 \times 4)$

= 8

Rectangle = 2×4

= 8

Total Area = 10

Expanding by a scale

factor of 4 multiplies

the area by $4 \times 4 = 16$,

so the new area is 160

<p>3a</p> $90 + x + 2x = 180$ $3x + 90 = 180$ $3x = 90$ $x = 30$ <p>Smallest angle = 30</p>	<p>3b Total = $180(5 - 2) = 540$</p> $80 + 100 + x + x + 20 + 2x + 40 = 540$ $4x + 240 = 540$ $4x = 300$ $x = 75$ <p>angles = 80 , 100 , 75, 95 , 190</p>	<p>3c total = 360</p> <p>That is always true, for any polygon</p> <p>$360 / 10 = 36$ for each exterior angle</p>
<p>3d</p> $12n = 360$ $n = 30$ <p>So there are 30 sides</p>	<p>4a</p> $5x + 2x + 1x = 10$ $8x = 10$ $x = 10/8 = 1.25$ <p>Cola = $5(1.25) = 6.25$ l = 6250 ml</p> <p>Orange Juice = $2(1.25) = 2.5$ l = 2500 ml</p> <p>Milk = 1.25 l = 1250 ml</p>	<p>4b</p> $0.65 \times 7.5 = 4.875 = 4.88$ $50 / 0.65 = 76.923 = 76$ liters
<p>5a</p> $A = \frac{(B+T)}{2} \times H$ $A = \frac{(5.5+3.5)}{2} \times 4.5$ $= 20.25$	<p>5b</p> $40 = \frac{(12+4)}{2} \times H$ $40 = 8H$ $5 = H$	<p>5c</p> $63 = \frac{(B+16)}{2} \times 4.5$ $\frac{63}{4.5} = \frac{(B+16)}{2}$ $14 = \frac{(B+16)}{2}$ $28 = B + 16$ $12 = B$