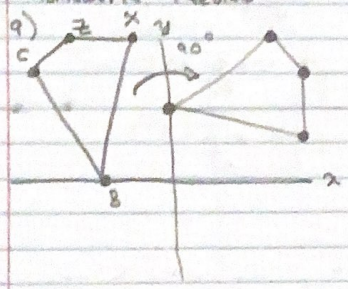
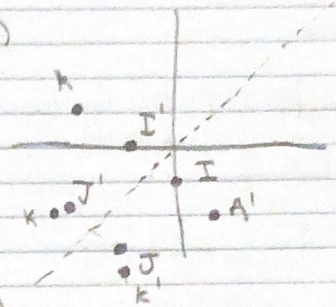
Lesson 2 (Properties of Transformations)

Homework Review

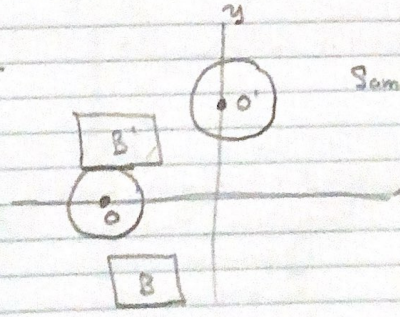
9) 

10) 

11) Rotating 180° means $(-x, -y)$

E (2, -2) → (-2, 2)
J (1, 2) → (-1, -2)
R (3, 2) → (-3, -2)
S (5, 2) → (-5, -2)

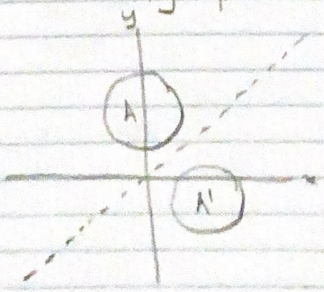
Ex



Rotation

Same { 1] Radius stayed the same
2] Circumference remained the same
3] Rotation size
1] Coordinates changed

Generally for rotation:
Line segments preserved
Angles preserved



Reflection

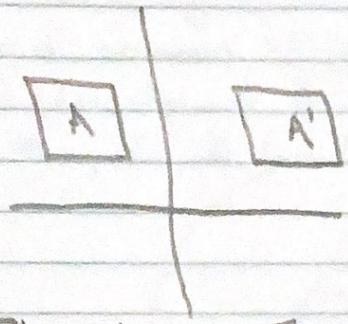
Preserved:
Radius
Circumference

Altered:
Coordinates

Generally for reflection
Line segment segments and angles are preserved

Lesson 2 Continued

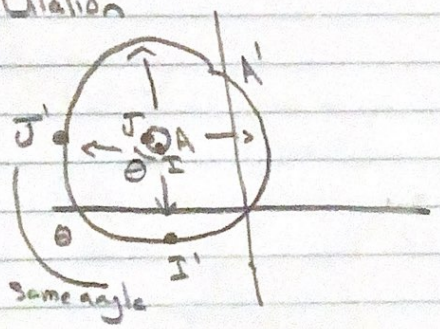
Translation



Generally
Line segments and angles are preserved

Observation and Theorem: Rigid transformations preserve both angle magnitude and line segment magnitude

Dilation



Preserved
Angles are preserved
Not preserved
Line segments are not preserved

Vertical and Horizontal Stretches / Compressions

$T_{(k \cdot x, y)}$ $T_{(x, k y)}$

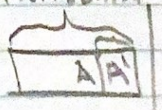
$k > 1$:= stretch
$k < 1$:= compression

Ex Horizontal stretch of 2
Sun point $(2,3)$?
$(4,3) \xleftarrow{T}$

Ex Vertical stretch of 3
for point $(2,3)$?
$(2,3) \xrightarrow{T} (2,9)$

Ex Horizontal compression of $\frac{1}{3}$
for point $(3,6)$?
$(1,6)$

Ex Horizontal compression

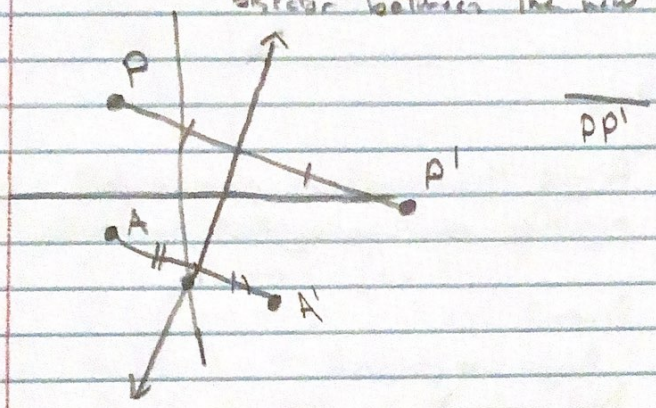


Lesson 2 Continued

Ex Identify the transformation

1] Each point on the line $y = 3x - 2$ maps to itself

2] All points not on the line $y = 3x - 2$ maps to a new point such that $y = 3x - 2$ is the perpendicular bisector between the new point and the old point.

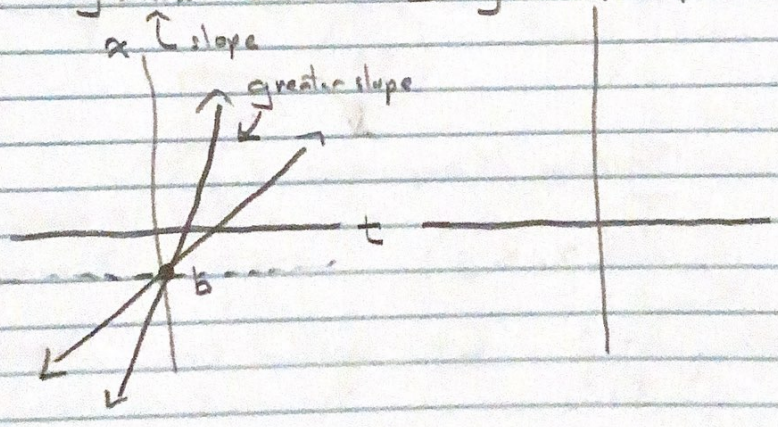


Slope

$y = mx + b$

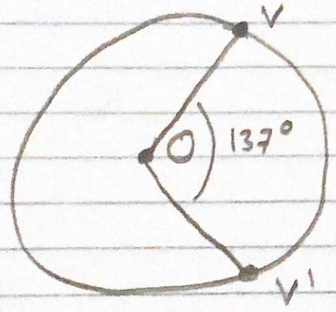
m ↑ slope

Ex $y = 2x + 1$



Lesson 2 Continued

Ex 1] Point O maps to itself
2] Every point V on C centered at O maps to a new point V' on C such that the angle between the lines $\overline{OV}$ and $\overline{V'O}$ is 137°



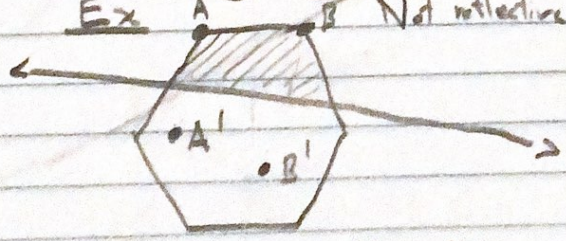
Rotation

Symmetry

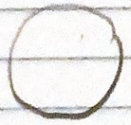
Definition: one shape is identical to another when given a rigid transformation (translation, reflection, rotation)

Reflective symmetry

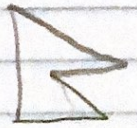
Ex



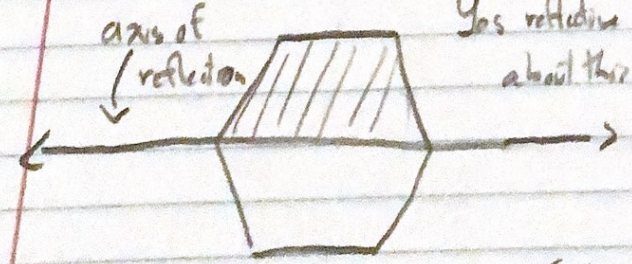
Not reflective symmetry



Have reflective symmetry? Yes



Have reflective symmetry? No

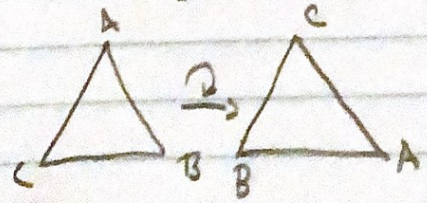


Yes reflective symmetry about this axis

Rotational Symmetry

(Number of times you could rotate it and it look the same)

Order 3



Rotational Symmetry