*y y*

*J*

*x T x*

*F*

*X*

*Y P*

1. rotation 180° about the origin
2. reflection across the y-axis

*B R y y*

*K*

*Z*

*x Q x*

*M*

*H F*

# Find the coordinates of the vertices of each figure after the given transformation.

1. rotation 90° clockwise about the origin

−4 1 −2

−4 −3 −5

1. translation: 5 units left and 5 units up

2 0 1 4

−3 0 0 −2

1. rotation 180° about the origin
2. dilation of 0.5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0 | 2 | 5 | −1 | 1 | 2 |
| −3 | −1 | −5 | 0 | 1 | −1 |

# Write a rule to describe each transformation.

11)

1 1 4 5

2 3 2 1

to

12)

−4 −3 −1

−3 1 0

to

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0.5 | 0.5 | 2 | 2.5 |  | −1 | 0 | 2 |
| 1 | 1.5 | 1 | 0.5 |  | −3 | 1 | 0 |

13)

1 3 4 5

0 3 2 −3

to

14)

−3 1 0

2 5 3

to

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| −1 | −3 | −4 | −5 |  | 2 | 5 | 3 |
| 0 | 3 | 2 | −3 |  | 3 | −1 | 0 |

15)

−3 −1 0

−5 −2 −3

16)

−3 −4 −1 1

−4 −1 3 −2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | to |  |  |  | to |  |
| −2 | 0 | 1 |  | 3 | 4 | 1 | −1 |
| −2 | 1 | 0 |  | 4 | 1 | −3 | 2 |

*y y*

*X'*

*Y' P'*

*x*

*J'*

*J*

*T T'*

*x*

*F*

*F'*

*X*

*Y P*

1. rotation 180° about the origin
2. reflection across the y-axis

*B R y y*

*K*

*Z*

*x Q Q' x*

*Z'*

*K'*

*R' B'*

*M M'*

*H F F' H'*

# Find the coordinates of the vertices of each figure after the given transformation.

1. rotation 90° clockwise about the origin

−4 1 −2

−4 −3 −5

−4 −3 −5

4 −1 2

1. translation: 5 units left and 5 units up

2 0 1 4

−3 0 0 −2

−3 −5 −4 −1

2 5 5 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| −0.25 | 0.5 | −0.25 |  | −2 | 0 | −3 |
| 0.25 | 0.5 | −0.25 |  | −5 | −2 | −1 |

1. rotation 180° about the origin
2. dilation of 0.5

# Write a rule to describe each transformation.

11)

1 1 4 5

2 3 2 1

to

0.5 0.5 2 2.5

1 1.5 1 0.5

12)

−4 −3 −1

−3 1 0

to

−1 0 2

−3 1 0

1

dilation of 2

translation: 3 units right

13)

1 3 4 5

0 3 2 −3

to

14)

−3 1 0

2 5 3

to

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| −1 | −3 | −4 | −5 |  | 2 | 5 | 3 |
| 0 | 3 | 2 | −3 |  | 3 | −1 | 0 |

reflection across the y-axis

rotation 90° clockwise about the origin

15)

−3 −1 0

−5 −2 −3

16)

−3 −4 −1 1

−4 −1 3 −2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | to |  |  |  | to |  |
| −2 | 0 | 1 |  | 3 | 4 | 1 | −1 |
| −2 | 1 | 0 |  | 4 | 1 | −3 | 2 |

translation: 1 unit right and 3 units up

rotation 180° about the origin

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