Answer Key – How Should I Move?

9.   **Graph Pair 1**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[2]
2	[6]
4	[10]
6	[14]
8	[18]

TIME (x)	POSITION (y)
0	[2]
2	[12]
4	[22]
6	[32]
8	[42]

Equation(s):

$y = 2x + 2$

Equation(s):

$y = 5x + 2$

Explanation:

Begin at 2; move 2 ft/sec.

Explanation:

Begin at 2; move 5 ft/sec.

9.   **Graph Pair 2**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[2]
2	[4]
4	[6]
6	[8]
8	[10]

TIME (x)	POSITION (y)
0	[5]
2	[7]
4	[9]
6	[11]
8	[13]

Equation(s):

$y = x + 2$

Equation(s):

$y = x + 5$

Explanation:

Begin at 2; move 1 ft/sec.

Explanation:

Begin at 5; move 1 ft/sec.

9.   **Graph Pair 3**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[18]
2	[16]
4	[14]
6	[12]
8	[10]

TIME (x)	POSITION (y)
0	[18]
2	[12]
4	[6]
6	[0]
8	[–6]

Equation(s):

$$y = x + 18$$

Equation(s):

$$y = 3x + 18$$

Explanation:

Begin at 18; move 1 ft/sec.

Explanation:

Begin at 18; move 3 ft/sec.

9.   **Graph Pair 4**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[2]
2	[2]
4	[2]
6	[2]
8	[2]

TIME (x)	POSITION (y)
0	[impossible]
2	[all points]
4	[impossible]
6	[impossible]
8	[impossible]

Equation(s):

$$y = 2$$

Equation(s):

$$x = 2$$

Explanation:

Begin at 2; don't move.

Explanation:

There is no movement that would result in this graph. It would require being all distances from the motion detector simultaneously.

9.   **Graph Pair 5**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[2]
2	[8]
4	[11]
6	[11]
8	[8]

TIME (x)	POSITION (y)
0	[10]
2	[4]
4	[4]
6	[6]
8	[8]

Equation(s):

$$y = \begin{cases} 3x+2, & x < 3; \\ 11, & 3 \le x < 7; \\ -3x+32, & x \ge 7 \end{cases}$$

Equation(s):

$$y = \begin{cases} -3x+10, & x < 2; \\ 4, & 2 \le x < 4; \\ x, & x \ge 4 \end{cases}$$

Explanation:

Begin at 2; move 3 ft/sec for 3 sec; stand still at 11 ft for 4 sec; move back toward the motion detector at 3 ft/sec.

Explanation:

Begin at 10; move toward the motion detector at 3ft/sec; stand still at 4 ft for 2 sec; reverse direction and move 1 ft/sec.

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9.   **Graph Pair 6**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[0]
2	[10]
4	[10]
6	[14]
8	[14]

TIME (x)	POSITION (y)
0	[18]
2	[14]
4	[14]
6	[6]
8	[6]

Graph Pair 6 (continued)

Equation(s):

$$y = \begin{cases} 2x+6, & x < 2; \\ 10, & 2 \le x < 4; \\ 2x+2, & 4 \le x < 6; \\ 14, & 6 \le x < 8; \\ 2x-2, & x \ge 8 \end{cases}$$

Equation(s):

$$y = \begin{cases} -2x+18, & x < 2; \\ 14, & 2 \le x < 4; \\ -4x+30, & 4 \le x < 6; \\ 6, & 6 \le x < 9; \\ -2x+24, & x \ge 9 \end{cases}$$

Explanation:

Begin at 0; move 2 ft/sec for 2 sec; stand still at 10 ft for 2 sec; again move 2 ft/sec for 2 second; stand still at 14 ft for 2 sec; then, move 2ft/sec again.

Explanation:

Begin at 18; move toward the motion detector at 2 ft/sec for 2 sec; stand still at 14 ft for 2 sec; continue moving 4 ft/sec for 2 sec; stand still at 6 ft for 2 sec; move again at 2 ft/sec.

9.   # Graph Pair 7

Graph A

TIME (x)	POSITION (y)
0	[2]
2	[5]
4	[17]
6	[66]
8	[258]

Graph B

TIME (x)	POSITION (y)
0	[18]
2	[6]
4	[3]
6	[2.25]
8	[2.0625]

Equation(s):

$$y = 2^x + 1$$

Equation(s):

$$y = 16 \cdot 0.5^x + 2$$

Explanation:

Begin at 2; double your speed every second.

Explanation:

Begin at 18; reduce your speed by half every second.

9.   **Graph Pair 8**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[2]
2	[14]
4	[18]
6	[14]
8	[2]

TIME (x)	POSITION (y)
0	[18]
2	[2]
4	[18]
6	[66]
8	[146]

Equation(s):

$$y = -(x-4)^2 + 18$$

Equation(s):

$$y = 4(x-2)^2 + 2$$

Explanation:

Begin at 2; move away from the motion detector, slowing down until you stop at 18 ft after 4 seconds; then reverse direction and move more quickly with each step.

Explanation:

Begin at 18; move toward the motion detector, slowing down until you stop at 2 ft after 2 seconds; then reverse direction and move more quickly with each step.

9.   **Graph Pair 9**

Graph A   Graph B

TIME (x)	POSITION (y)
0	[27]
2	[11]
4	[3]
6	[3]
8	[11]

TIME (x)	POSITION (y)
0	[none]
2	[5]
4	[~3.6, ~6.4]
6	[3, 7]
8	[~7.4, ~2.6]

Equation(s):

$$y = (x-5)^2 + 2$$

Equation(s):

$$x = (y-5)^2 + 2$$

Explanation:

Begin at 27; move toward the motion detector, slowing down until you stop at 2 ft after 5 seconds; then reverse direction and move more quickly with each step.

Explanation:

There is no movement that would result in this graph. Except for the 2 sec mark, it would require being at 2 places at the same time.