Calculus 1.1

Distance Formula

 Finding a distance between two points

 If the x coordinates are the same, just subtract the y values.

 $\left(3, 2\right)\& (3, -9)$

 $2-\left(-9\right)=11$

 If the y coordinates are the same, just subtract the x values.

 $\left(5, -6\right)\& (-2, -6)$

 $5-\left(-6\right)=11$

 Graphing and creating a right triangle

 $\left(-2, 1\right)\& (4, -2)$

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 $6^{2}+3^{2}=d^{2}$

 $36+9=d^{2}$

 $45=d^{2}$

 $3\sqrt{5}=d$

Verifying a Right Triangle

 Show that these three points are the vertices of a right triangle.

 $A\left(1, 3\right) B\left(1, 7\right) C(5, 3)$

 $AB=4$

 $BC=\sqrt{\left(1-5\right)^{2}+\left(7-3\right)^{2}}=\sqrt{16+16}=4\sqrt{2}$

 $AC=4$

 $4^{2}+4^{2}=\left(4\sqrt{2}\right)^{2} 16+16=32$

Given the distance, find a missing x or y coordinate

 The distance between $(2, 3)$ & $(x, 6)$ is 8, solve for $x$.

 $\sqrt{\left(x-2\right)^{2}+\left(6-3\right)^{2}}=8$

 $\left(x-2\right)^{2}+9=64$

 $\left(x-2\right)^{2}=55$

 $x-2=\pm \sqrt{55}$ $x=2\pm \sqrt{55}$

Midpoint

Concept Finding the average between two numbers.

Formula $(\frac{x\_{1}+x\_{2}}{2}, \frac{y\_{1}+y\_{2}}{2})$

Find the midpoint between $\left(2,3\right)\& \left(8, -5\right). $ $\left(\frac{2+8}{2},\frac{3+\left(-5\right)}{2}\right) (5, -1)$

 Given $A(3, 6)$ is the midpoint of BC with $B(-2, 13)$, find C.

 $\left(-2, 13\right) (3, 6)$

 x’s from -2 to 3 is 5 add to 5 to 3 $x=8$

 y’s from 13 to 6 is -7 subtract 7 from 6 y= -1

 $C=\left(8, -1\right)$

Board It Up

1) Find the distance between $\left(-2, 4\right)\& \left(5, 8\right).$

2) Find the distance between (2, 5) & (2, 39.2).

3) Verify that these three points form a right triangle.

 $A\left(3, -2\right) B\left(8, -2\right) C) C(8, 4)$

4) If the distance between $A\left(x, 4\right) \& B(2, 6)$ is 5. Find x.

5) Find the midpoint of AB with $A\left(-2, 9\right)\& B\left(6, -1\right).$