Finite Math Section 1_1
Solutions and Hints

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for the book:
Finite Mathematics, 7th Edition
by S. T. Tan.

DO NOT PRINT THIS OUT AND TURN IT IN !!!!!!!!
This is designed to assist you in the event you get stuck.
If you do not do the work you will NOT pass the tests.

Section 1.1:

Problem 24:
Find the distance between the points (-2, 1) and (10, 6)

Simply use the distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

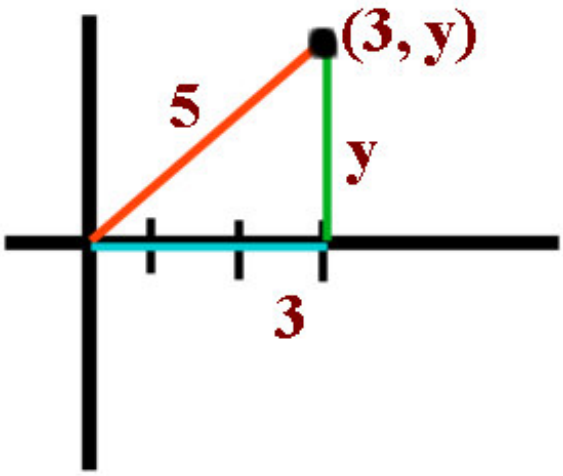
Or rather try this:

$$d = \sqrt{(10 - -2)^2 + (6 - 1)^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13$$

So the distance between the points is **13 units.**

Problem 26:
Find the **coordinates** of the points that are 5 units away from the origin and have an x-coordinate equal to 3.

Picture:



So use the Pythagorean theorem $x^2 + y^2 = d^2$ with x = 3 and distance d = 5:

$3^2 + y^2 = 5^2$ → $9 + y^2 = 25$

$y^2 = 25 - 9$

$y^2 = 16$

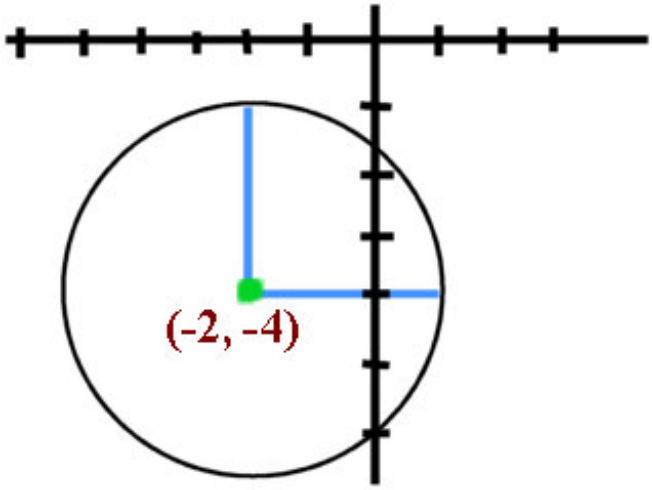
$y = 4$ **or** -4

So the coordinates are: **(3, 4) or (3, -4)**

Problem 30:

Find the equation of the circle with radius 3 and center (-2, -4).

So the picture would be:



However, this is actually very straight forward, all you need to do is plug stuff into the equation for a circle: $(x-h)^2+(y-k)^2=r^2$

So for this problem you simply have:
$(x - -2)^2 + (y - -4)^2 = 3^2$

Simplifying you get:
$(x + 2)^2 + (y + 4)^2 = 9$

Problem 39:
Will Barclay wishes to determine which antenna he should purchase for his home. The TV store has supplied him with the following information:

Range in Miles			
VHF	**UHF**	**Model**	**Price**
30	20	A	$40
45	35	B	$50
60	40	C	$60
75	55	D	$70

Will wishes to receive Channel 17 (VHF), which is located 25 mi east and 35 miles north of his home and Channel 38 (UHF), which is located 20 mi south and 32 mi west of his home. Which model will allow him to receive both channels at the least cost? (Assume that the terrain between Will's home and both broadcasting stations is flat.)

To solve this you calculate the distance Will's home is from both stations and then look at the chart. Notice we consider his home to be at coordinate (0, 0). Specifically:

The distance from Will's home to Channel 17 is:
$d=\sqrt{(25-0)^2+(35-0)^2}\approx 43.012$ miles
Since that's a VHF channel he must have model B, C, or D to receive it.

Now we calculate the distance from Will's home to Channel 38 to be:
$d=\sqrt{(-20-0)^2+(-32-0)^2}\approx 37.7359$ miles
Since that's a UHF channel he must have model C or D to receive it.

So to receive both channels (for the lowest cost) he must have **model C**.