1) B

First, we must find the ratio between the two similar triangles. We do this by setting up a proportion of the corresponding sides.

$$\frac{4}{8.8} = \frac{3.5}{y}$$

Now we cross multiply to find the value of y.

$$4y = 30.8$$
$$y = 7.7$$

Now we do the same process to find the value of x.

$$\frac{4}{8.8} = \frac{5.5}{x}$$
$$4x = 48.4$$
$$x = 12.1$$

Now when we add x and y we get

$$12.1 + 7.7 = 19.8$$

2) C

We know that the angle of AED has a measure of

$$180 - (90 + 41) = 49$$

If the two right triangles are congruent, that means that angle CDE is also 49 degrees. With this information we can find the angle measure of x by subtracting the two base angles of triangle DBE from 180 to find x.

$$180 - (49 + 49) = 82$$

3) C

If the two triangles are congruent, we can set up a proportion to find the missing side.

$$\frac{14}{6} = \frac{16}{x}$$
$$14x = 96$$
$$x = 6.9\ feet$$

4) A

If one angle of the rhombus is 36 degrees, the angle across is also 36. Furthermore, the total angle measure of any quadrilateral is 360 degrees. We can use this info to find the remaining two angle measures of the larger rhombus.

$$360 - (2 \times 36) = 288$$

Next, we know that the two unknown angles will be equal to each other. So we can divide 288 to find the individual angles.

$$288 \div 2 = 144$$

Since the two rhombi are similar, their angle measures will be the same. This means that the obtuse angle x will be equal to 144 degrees.

5) D

First let's find the area of the larger triangle ACE with the ratio given to us. Since the ratio 3:2 is related to the side dimensions, our area ratio will be the square of that, 9:4. Now we can set up a proportion to find the area of triangle ACE.

$$\frac{9}{4} = \frac{x}{40}$$
$$360 = 4x$$
$$90\ un^2 = x$$

Now, we subtract the area of triangle ACE by triangle BCD, to get the area of the trapezoid.

$$90 - 40 = 50\ un^2$$

6)D

We know that the angles shown on both parallelograms are supplementary as they are similar. With this knowledge we can set up an algebraic equation and solve for x.

$$(2x - 4) + \left(\frac{1}{2}x + 10\right) = 180$$
$$2\frac{1}{2}x + 6 = 180$$
$$2\frac{1}{2}x = 174$$
$$x = 69.6$$

7) C

Let's set up a proportion to find the dimensions of the rectangle ONKL. We know the longer side of rectangle JKLM is 9 inches while the longer side of rectangle ONKL is 3 inches. Furthermore, the longer side of rectangle ONKL is the shorter side of rectangle JKLM. We set up the proportion as follows and cross multiply.

$$\frac{9}{3} = \frac{3}{x}$$
$$9x = 9$$
$$x = 1\ in$$

Now, we can find the area of rectangle ONKL

$$3\ \text{in} \times 1\ \text{in} = 3\ in^2$$

8) A

If the vertices of the smaller equilateral triangles are at the midpoint of the larger triangles, that means the side lengths of the smaller triangles are half of that of the larger triangles. In this case the smaller triangles have a side length of 5 inches. Furthermore, we know that when equilateral triangles are bisected, they created two 30-60-90 triangles. We can use this to find the measure of AB. If the hypotenuse of one 30-60-90 triangle is 5 that means the longer leg will be $5\sqrt{3}$. We multiply that by 2 to get the full length of A to B.

$$10\sqrt{3}$$

9) B

First, we must find the measure of the last angle of the right triangle. We do this by subtracting the sum of the known angles by 180.

$$180 - (90 + 32) = 58$$

If the unknown angle of the right triangle is 59 that means the unknown angle adjacent to it will be complementary to 59. Thus, we can find the angle of the unknown angle of the adjacent scalene triangle by subtracting 59 from 90.

$$90 - 58 = 32$$

Now, we set up an algebraic equation to solve for x, knowing that the measures of the angles of the scalene triangle will equal 180.

$$32 + 87 + (8x + 5) = 180$$
$$124 + 8x = 180$$
$$8x = 56$$
$$x = 7$$

10) D

First, we must realize that triangle CDE is an isosceles triangle with side lengths 5, 5, and 10. We are able to know this as the perimeter of the triangle is 20 inches, with two sides being equal. Now, we set up a proportion to find AG which is the longer side of triangle ADG.

$$\frac{1}{4} = \frac{10}{x}$$
$$x = 40\ inches$$