Benchmark Review with Answers

Tuesday, September 17, 2024   9:54 PM
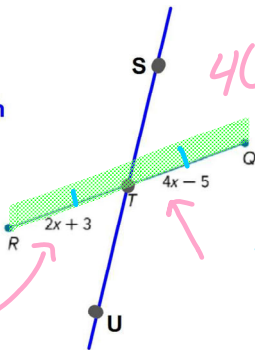
📄 **Benchmark Review**

#1

SU bisects RQ

What is the length of RQ?
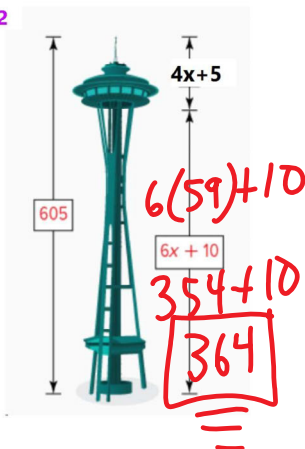
$11 + 11 = \boxed{22}$

S

Q

$4x - 5$

T

$2x + 3$

R

U

$4(4) - 5$
$16 - 5$
$\boxed{11}$

$2(4) + 3$
$8 + 3$
$\boxed{11}$

$2x + 3 = 4x - 5$
$-2x \qquad\quad -2x$
_____
$3 = 2x - 5$
$+5 \qquad\quad +5$
_____
$\dfrac{8}{2} = \dfrac{2x}{2}$

$\boxed{4 = x}$

#2

4x+5

605

6x + 10

$6(59)+10$

$354+10$

$\boxed{364}$

Darrell is visiting the Space Needle in Seattle, Washington.
He knows that the total height of the Space Needle is 605 feet.
The distance from the ground to the observation deck is represented by the expression 6x +10.
The distance from the observation deck to the top of the Space Needle is 4x +5
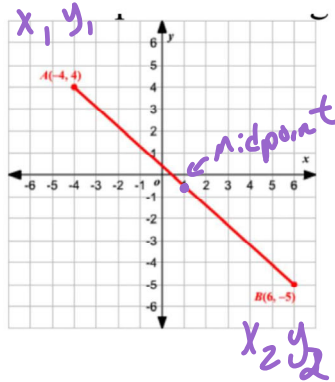Help Darrell find the distance from the ground to the observation deck.

$$4x+5+6x+10=605$$
$$10x+15 = 605$$
$$-15 \qquad -15$$
$$\frac{10x}{10} = \frac{590}{10}$$
$$\boxed{x=59}$$

#3 Find the coordinates of the midpoint of $\overline{AB}$.

x_1, y_1

$A(-4, 4)$

← midpoint

$B(6, -5)$

x_2, y_2

Find the distance of AB.

THE DISTANCE FORMULA

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$m = \left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$$

$$\frac{-4+6}{2}, \frac{4+-5}{2}$$

$$\frac{2}{2}, \frac{-1}{2} = \left(1, -\frac{1}{2}\right)$$
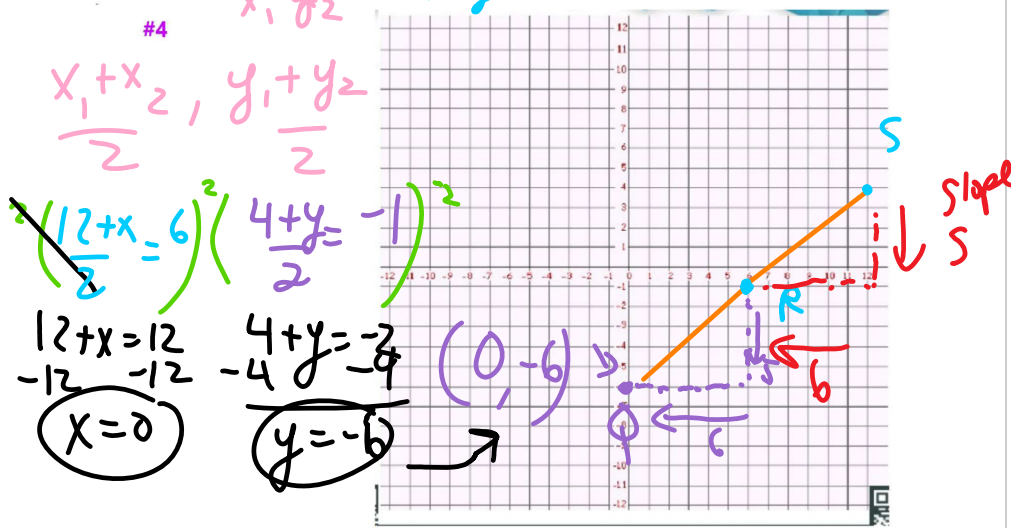
$$\sqrt{(6--4)^2 + (-5-4)^2}$$

$$(6+4)^2 + (-5+-4)^2$$

$$(10)^2 + (-9)^2$$

$$100 + 81$$

$$\sqrt{181} = 13.45$$

Find the coordinates of Q if R(6, −1) is the midpoint of $\overline{QS}$ and S has coordinates (12, 4). Use the midpoint formula and graph to prove.

#4

x_1, y_2

x, y

$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

$$\left(\frac{12 + x}{2} = 6\right)^2 \left(\frac{4 + y}{2} = -1\right)^2$$

$12 + x = 12$
$-12 \quad -12$
$\boxed{x = 0}$

$4 + y = -2$
$-4 \quad -4$
$\boxed{y = -6}$

$(0, -6)$

slope
S
R
6
Q
6
S

#5

2565

0

2565

0

0

The distance to drive from San Francisco to New York is about 2,565 miles.

If the weighted average from San Fran to NY is 2 to 5 at what mile marker would the gas station be located?

$$\boxed{1832}$$

If there was a ratio of 3:4 traveling from NY to San Fran where at what mile marker would you stop for gas?

0 ⤬ 2565

③   ④

$$\frac{0 + 7695}{3 + 4} = \frac{7695}{7} = \boxed{1099.3}$$

0
2

2565
5

$$\frac{0 + 12825}{2 + 5} = \frac{12825}{7}$$

$$\boxed{1832}$$

$$\boxed{1099.3}$$

#6 Find the coordinate of P that represents the weighted average for the point, based on the given conditions.

A ? B C number line from -5 to 10

Point A has a weight of 2, and point B has a weight of 3.

-3
$3 \quad 2$

4

$$\frac{-6+12}{2+3} = \boxed{\frac{6}{5}} = \boxed{1.2} = \boxed{1\tfrac{1}{5}}$$

#7

Find P on $\overline{AF}$ such that the ratio of AP to PF is 1:3.

P

A   F

−16 −14 −12 −10 −8 −6 −4 −2   0   2

$$-15 \times -1$$
$$\textcircled{1} \quad \textcircled{3}$$
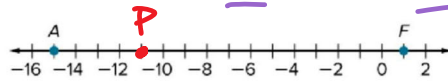
$$\frac{-45+1}{1+3} = \frac{-44}{4} = \boxed{-11}$$

COMPLEMENTARY AND SUPPLEMENTARY ANGLES

#8

$20.5 + 6$

$(x + 6)^0$ 26.5

$3(20.5) + 2 = 63.5$

$(3x + 2)^0$

115^0 $(2x + 9)^0$

$2(28) + 9 = 65$

$\begin{array}{r} 26.5 \\ + 63.5 \\ \hline 90 \checkmark \end{array}$

$\begin{array}{r} 115 \\ + 65 \\ \hline 180 \checkmark \end{array}$
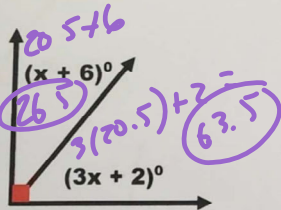
Complementary
*When the sum
of two angles
add up to 90 degrees
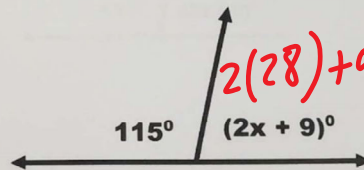
Supplementary
*When the sum of two
angles add up to
180 degrees

$x + 6 + 3x + 2 = 90$

$4x + 8 = 90$

$\quad -8 \quad -8$

$\dfrac{4x}{4} = \dfrac{82}{4}$

$\boxed{x = 20.5}$

$115 + 2x + 9 = 180$

$124 + 2x = 180$

$-124 \qquad -124$

$\dfrac{2x}{2} = \dfrac{56}{2}$

$\boxed{x = 28}$

#9

$15(11) - 30$
$165 - 30$
135
$45 \checkmark$

$15x - 30$

E   C
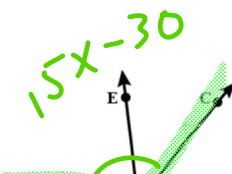
<DOB = 45
<COB = 15x - 30

$+ = 180$

Solve for the

165 13>
45
+ 180 ✓

13

45
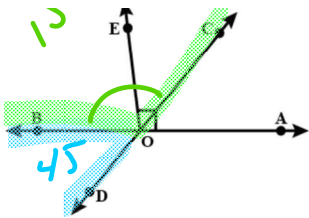
Solve for the value of x.
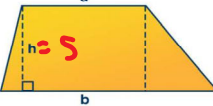
$$45 + 15x - 30 = 180$$

$$15 + 15x = 180$$
$$-15 \qquad -15$$
$$\overline{}$$
$$\frac{15x}{15} = \frac{165}{15}$$
$$\boxed{x = 11}$$

✓

$7+13=$
$\dfrac{(20)}{2}=$
$10(5)$
50 ✓

#10 **Area of a Trapezoid**

?
50

$$A = \dfrac{a+b}{2}h$$

h = 5

13

Where:
A = Area of a Trapezoid
a = length of base 1
b = length of base 2
h = height of the trapezoid

The area of a trapezoid is 50 cm.
The height is 5cm.
One of the bases is 13 cm.
Find the other base length. ?

OR

$$A = \dfrac{1}{2}h(b_1 + b_2)$$

$$2\left(50 = \dfrac{(a+13)}{2}(5)\right)2$$

$$\dfrac{100}{5} = \dfrac{(a+13)(5)}{5}$$

$$20 = a + 13$$
$$-13 \qquad -13$$
$$\boxed{7 = a}$$

$$50 = \dfrac{1}{2}(5)(13+b)$$

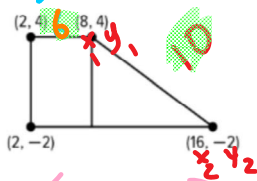$$\dfrac{50}{2.5} = \dfrac{(2.5)(13+b)}{2.5}$$

$$20 = 13 + b$$
$$-13 \quad -13$$
$$\boxed{7 = b}$$

#11 **Determine the perimeter.**

Add all 4 Sides!!

A parcel of land is divided into a rectangular region and a triangular region as shown.

$9-2$

$(4--2)=6$

$(2,4)$ 6 $(8,4)$ y, 10

$(2,-2)$ $(16,-2)$ x_2 y_2

14 R

$=$

$(16-2)$

THE DISTANCE FORMULA

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(16-8)^2 + (-2-4)^2}$$

$$\sqrt{(8^2) + (-6)^2}$$

$$\sqrt{64 + 36}$$

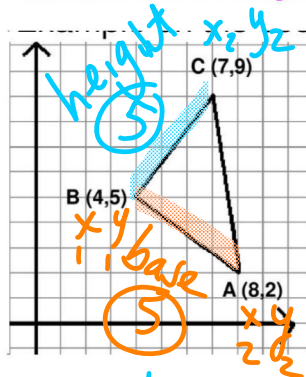$$\sqrt{100} = \boxed{10}$$
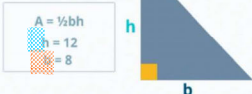
$6+6+14+10$

$12+14+10$

$26+10$

$\boxed{36}$

#12 **Find the area of the triangle.**

height x_2 y_2

C (7,9)

(3)

B (4,5)

x y base

(5)

A (8,2)

x y
2 2

Example

A = ½bh
h = 12
b = 8

h

b

THE DISTANCE FORMULA

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Base

$\sqrt{(8-4)^2 + (2-5)^2}$

$(4)^2 + (-3)^2$

$16 + 9$

$\sqrt{25} = \boxed{5}$

$A = \frac{1}{2} bh$

$\frac{1}{2}(5)(5)$

$\frac{1}{2}(25)$

$\boxed{12.5}$

height

$\sqrt{(7-4)^2 + (9-5)^2}$

$3^2 + 4^2$

$9 + 16 = \boxed{5}$

$\sqrt{25}$