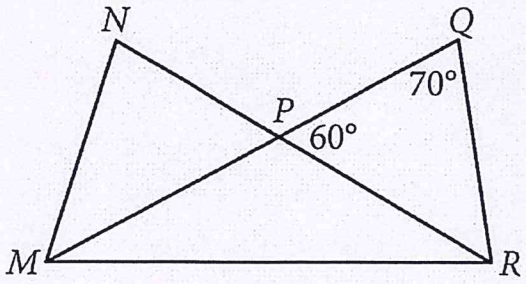
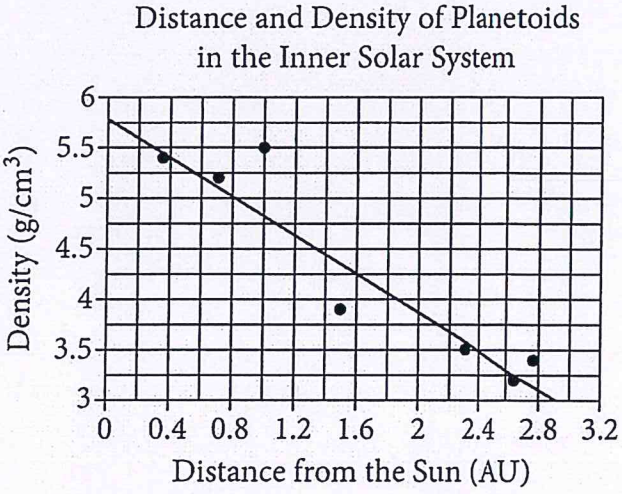
Bellwork Alg 2 Wednesday, March 27, 2019

1. In the figure below, $\overline{MQ}$ and $\overline{NR}$ intersect at point $P$, $NP = QP$, and $MP = PR$. What is the measure, in degrees, of $\angle QMR$ ? (Disregard the degree symbol when gridding your answer.)




Questions 2 and 3 refer to the following information.




The scatterplot above shows the densities of 7 planetoids, in grams per cubic centimeter, with respect to their average distances from the Sun in astronomical units (AU). The line of best fit is also shown.

2. According to the scatterplot, which of the following statements is true about the relationship between a planetoid's average distance from the Sun and its density?

A) Planetoids that are more distant from the Sun tend to have lesser densities.

B) Planetoids that are more distant from the Sun tend to have greater densities.

C) The density of a planetoid that is twice as far from the Sun as another planetoid is half the density of that other planetoid.

D) The distance from a planetoid to the Sun is unrelated to its density.

3. An astronomer has discovered a new planetoid about 1.2 AU from the Sun. According to the line of best fit, which of the following best approximates the density of the planetoid, in grams per cubic centimeter?

A) 3.6 B) 4.1 C) 4.6 D) 5.5

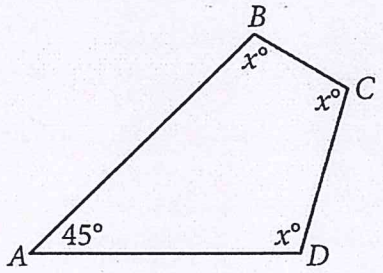
4. Lani spent 15% of her 8-hour workday in meetings. How many minutes of her workday did she spend in meetings?

A) 1.2 B) 15 C) 48 D) 72

5. A customer paid $53.00 for a jacket after a 6 percent sales tax was added. What was the price of the jacket before the sales tax was added?

A) $47.60 B) $50.00 C) $52.60 D) $52.84

6. In the figure at the right, what is the value of x ?




A) 45 B) 90 C) 100 D) 105

7. Which of the following is equivalent to this expression: $x^2 + 6x + 4$ ?

A) $(x+3)^2+5$ B) $(x+3)^2-5$ C) $(x-3)^2+5$ D) $(x-3)^2-5$

8. Ken is working this summer as part of a crew on a farm. He earned $8 per hour for the first 10 hours he worked this week. Because of his performance, his crew leader raised his salary to $10 per hour for the rest of the week. Ken saves 90% of his earnings from each week. What is the least number of hours he must work the rest of the week to save at least $270 for the week?

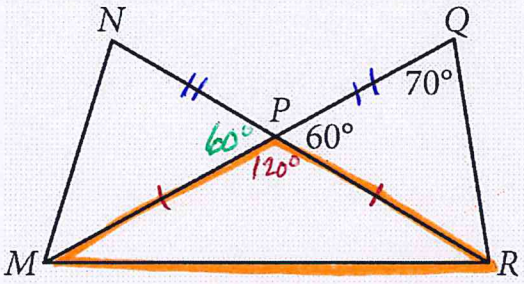
A) 38 B) 33 C) 22 D) 16

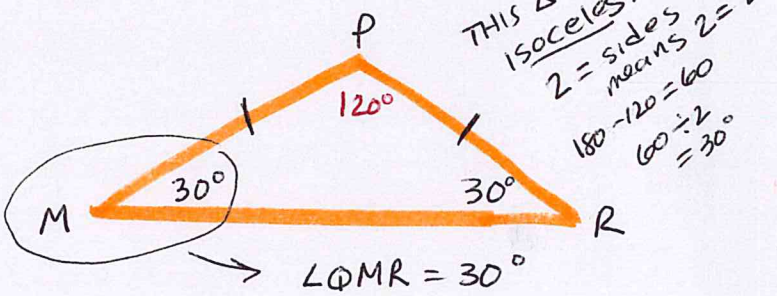
9. The function $f$ is defined by $f(x) = (x+3)(x+1)$. The graph of f in the xy-plane is a parabola. Which of the following intervals contains the x-coordinate of the vertex of the graph of $f$?

A) $-4 < x < -3$ B) $-3 < x < 1$ C) $1 < x < 3$ D) $3 < x < 4$

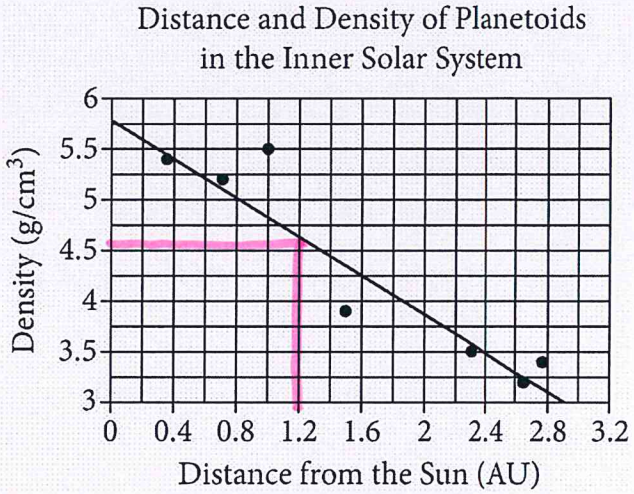
Bellwork Alg 2 Wednesday, March 27, 2019 ANSWERS

1. In the figure below, $\overline{MQ}$ and $\overline{NR}$ intersect at point $P$, $NP = QP$, and $MP = PR$. What is the measure, in degrees, of $\angle QMR$ ? (Disregard the degree symbol when gridding your answer.)




Questions 2 and 3 refer to the following information.




The scatterplot above shows the densities of 7 planetoids, in grams per cubic centimeter, with respect to their average distances from the Sun in astronomical units (AU). The line of best fit is also shown.

2. According to the scatterplot, which of the following statements is true about the relationship between a planetoid's average distance from the Sun and its density?

A) Planetoids that are more distant from the Sun tend to have lesser densities.

B) Planetoids that are more distant from the Sun tend to have greater densities.

C) The density of a planetoid that is twice as far from the Sun as another planetoid is half the density of that other planetoid.

D) The distance from a planetoid to the Sun is unrelated to its density.

3. An astronomer has discovered a new planetoid about 1.2 AU from the Sun. According to the line of best fit, which of the following best approximates the density of the planetoid, in grams per cubic centimeter?

A) 3.6 B) 4.1 C) 4.6 D) 5.5

4. Lani spent 15% of her 8-hour workday in meetings. How many minutes of her workday did she spend in meetings?

A) 1.2 B) 15 C) 48 D) 72

$8\text{hrs} \cdot \frac{60\text{min}}{1\text{hr}} = 480$ minutes

15% of 480 → $(.15)(480) = 72$ min

5. A customer paid $53.00 for a jacket after a 6 percent sales tax was added. What was the price of the jacket before the sales tax was added?

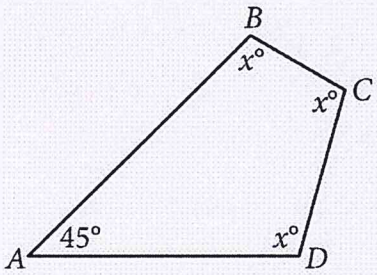
A) $47.60 B) $50.00 C) $52.60 D) $52.84

$100\% + 6\% = 106\% \Rightarrow 1.06$

$x =$ original price

$\frac{(1.06)x}{1.06} = \frac{53.00}{1.06}$ $\quad x = \$50$

6. In the figure at the right, what is the value of x ?




Sum of ∠s in a quadrilateral is 360°

A) 45 B) 90 C) 100 D) 105

$45° + x + x + x = 360°$

$3x + 45 = 360$

$3x = 315$

$x = 105$

7. Which of the following is equivalent to this expression: $x^2 + 6x + 4$ ?

A) $(x+3)^2 + 5$ B) $(x+3)^2 - 5$ C) $(x-3)^2 + 5$ D) $(x-3)^2 - 5$

↳ $(x+3)^2 = x^2+6x+9 - 5 = x^2+6x+4$

8. Ken is working this summer as part of a crew on a farm. He earned $8 per hour for the first 10 hours he worked this week. Because of his performance, his crew leader raised his salary to $10 per hour for the rest of the week. Ken saves 90% of his earnings from each week. What is the least number of hours he must work the rest of the week to save at least $270 for the week?

A) 38 B) 33 C) 22 D) 16

\$8/hr 1st 10 hrs $= \$80$

\$10/hr last $x$ hrs $= \$10x$

$.90(80+10x) \geq 270$

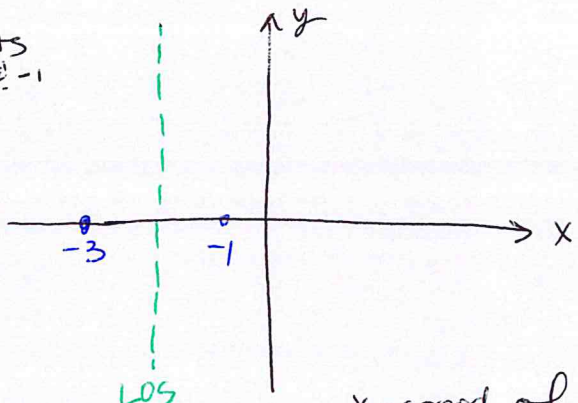
$80 + 10x \geq 300$

$10x \geq 220$ $\quad x \geq 22$

9. The function $f$ is defined by $f(x) = (x+3)(x+1)$. The graph of f in the xy-plane is a parabola. Which of the following intervals contains the x-coordinate of the vertex of the graph of $f$?

A) $-4 < x < -3$ B) $-3 < x < 1$ C) $1 < x < 3$ D) $3 < x < 4$

x-intercepts are $-3$ & $-1$




LOS $x = -2$ →

x-coord of the vertex is equal to LOS: $(-2, y)$