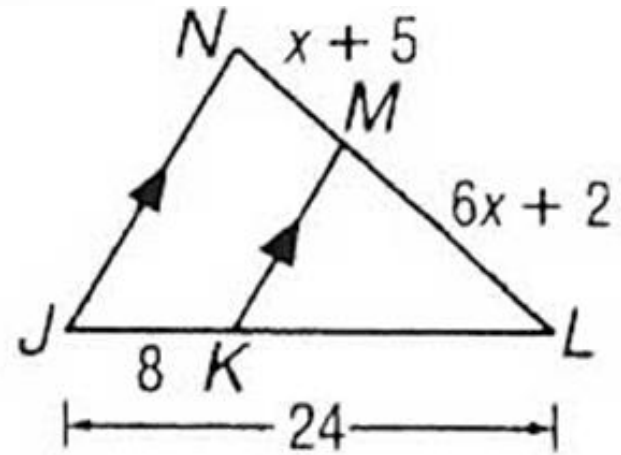# Mastery Test & Exam Review Day #1

# Warm Up

1. Explain why the triangles are similar and write a similarity statement. Then, find x, NL, and ML.



For #2 and 3, find the exact values of the solution(s).

2. $2x^2 + 4x = 8$

3. $26 = -1 + (27x)^{\frac{3}{4}}$

4. A group of students is planning a school dance for the underclassmen. The cost per ticket to the dance is inversely proportional to the amount of people that will attend the dance. It will cost $20 per ticket if 50 people come to the dance. How much will it cost per ticket if 100 people will come to the dance?

# Warm Up Answers

**1. Explain why the triangles are similar, then write a similarity statement. Find the value of x, NL, and ML.**
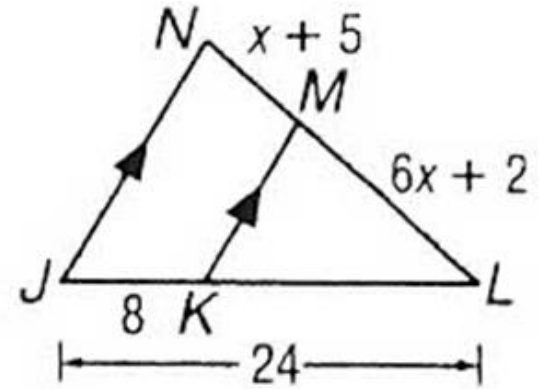


**<L** ≅ **<L** due to reflexive property, <**LMK** ≅ <**LNJ** and

**<LJN** ≅ **<LKM** because if lines are //, then corresponding angles are congruent.  So ΔJLN ~ ΔKLM by AA~.

**BE CAREFUL!!!**
**Do**

| | | |
|---|---|---|
| **Side** | **=** | **Side** |
| **Side** | | **Side** |

$$\frac{6x + 2}{7x + 7} = \frac{16}{24}$$

**NOT**

$$24(6x + 2) = 16(7x + 7)$$
$$144x + 48 = 112x + 112$$

| | | |
|---|---|---|
| **Part** | **=** | **Side** |
| **Side** | | **Side** |

**x = 2,**

**NL = 21,     ML = 14**

# Warm Up Answers

2. Find the exact values of the solutions for $2x^2 + 4x = 8$

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(2)(-8)}}{2(2)} = \frac{-4 \pm \sqrt{80}}{4} = \frac{-4 \pm \sqrt{16 \bullet 5}}{4}$$

$$= \frac{-4 \pm 4\sqrt{5}}{4} = \frac{-1 \pm 1\sqrt{5}}{1} = -1 \pm \sqrt{5}$$

3. Solve.

$$26 = -1 + (27x)^{\frac{3}{4}}$$

Isolate.  Then use Inverse functions!          **X = 3**

# Warm Up Answers

4. A group of students is planning a school dance for the underclassmen. The cost per ticket to the dance is inversely proportional to the amount of people that will attend the dance. It will cost $20 per ticket if 50 people come to the dance. How much will it cost per ticket if 100 people will come to the dance?

**Remember: Use y = k/x for inverse variation.**

**C = k/p    where c = cost of ticket, p = # of people**

**20 = k/50   ->    k = 1000**

**so c = 1000/p is the inverse variation equation for our problem**

**C = 1000/100 = $10 per ticket if 100 people come**

# Homework Discussion
# Review Packet #32-51

# Homework:
## Update your outline!

Tonight and Tomorrow Night
- Finish Review Packet

Ideas for Studying for Mastery Test & Exam
- Use your Interactive Student Notebook
- Use your study guides and test reviews throughout the class
- Complete this power point
- Take advantage of the extra resources on my website ☺

# Discuss Exam Rules, Schedule, etc.

Before the Final Exam:

- Eat a good breakfast/lunch

- Use the Restroom before the exam period!!

- Bring something to do after the exam – you'll put it under your desk before the exam (no shuffling in bags during the exam!!)

- Turn Off - and Turn In - your phone

- Study your formulas, vocabulary, etc

- **Get a good night's sleep!!**

- **Bring ALL needed supplies (see next slide)**

# Exam Day Supply Knowledge

Supplies For Final Exam:

- Calculator, TI-83 or TI-84. The calculator will be cleared upon entering exam.

- A Well-Charged Calculator OR Extra Batteries for the Calculator (especially if you can't remember when you last replaced them)

- Two Number 2 Pencils

- We'll supply you with blank paper and graph paper, which you'll turn in after the exam

# Units 1-5 REVIEW

Everyone needs to get the following:

Whiteboard
Expo Marker
Eraser

Everyone should ALSO have a sheet of paper, calculator and pencil to take notes!

# Jeopardy

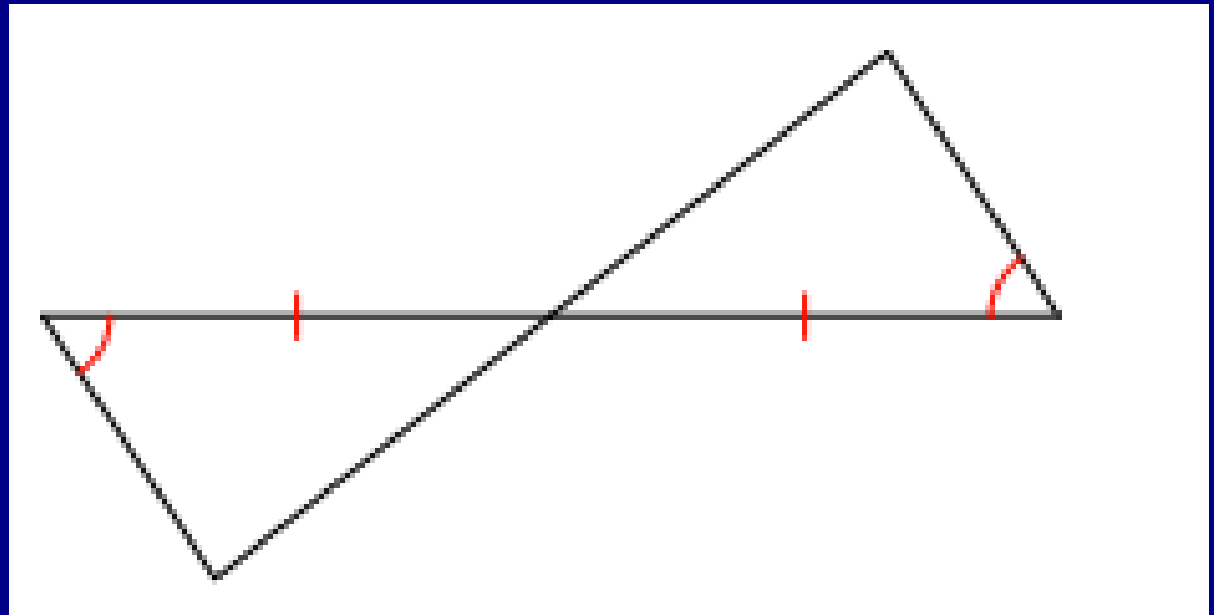| Similar & Congruent Δs | Quadratics | Radicals & Inverses | Transfor-mations | Trig. & Random |
|:---:|:---:|:---:|:---:|:---:|
| $100 | $100 | $100 | $100 | $100 |
| $200 | $200 | $200 | $200 | $200 |
| $300 | $300 | $300 | $300 | $300 |
| $400 | $400 | $400 | $400 | $400 |
| $500 | $500 | $500 | $500 | $500 |

- The following 2 triangles are congruent by which postulate?
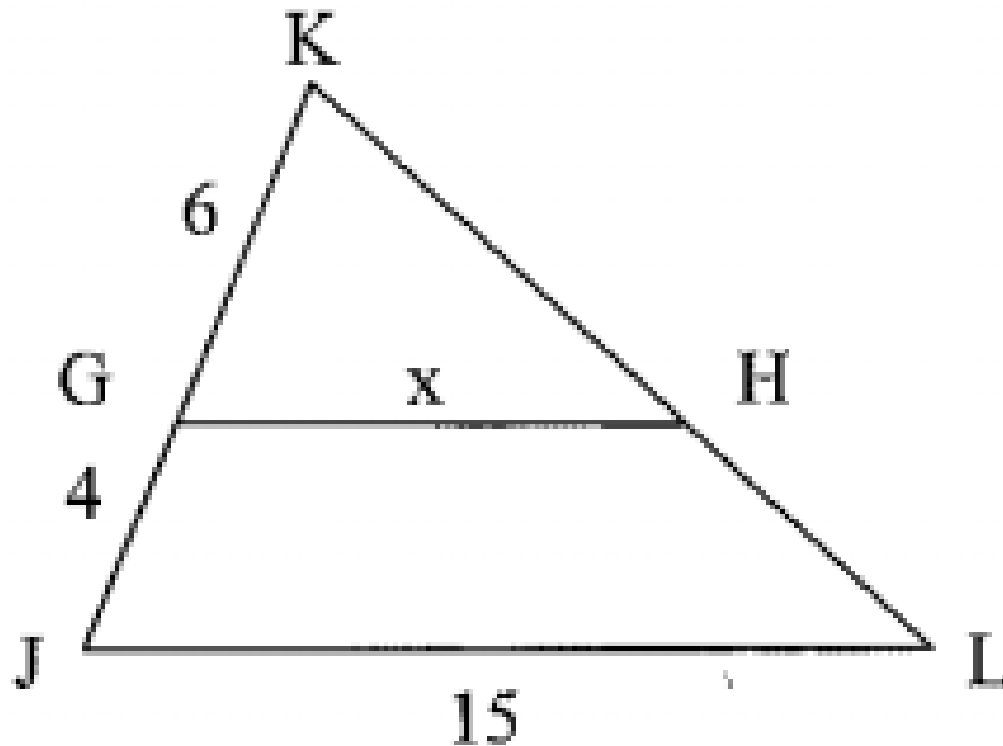


- AAS

# 1 - $200

Find *CD*



- 8

# 1 - $300

- Find x



ΔJKL ~ ΔGKH

K

6

G          x          H

4

J                              L

15

- X = 9
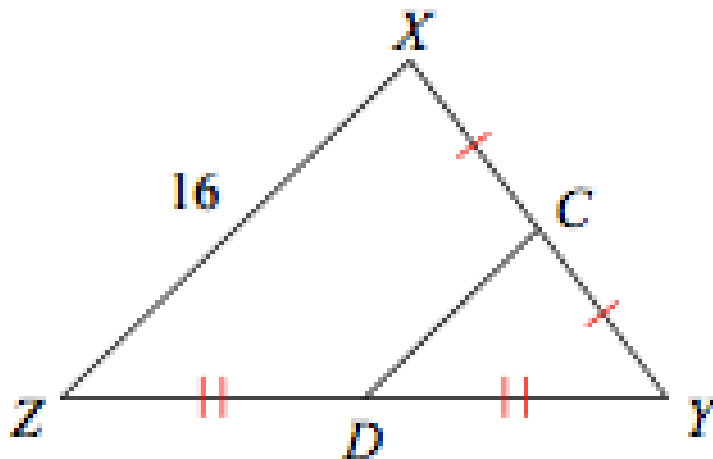
- What postulate or theorem would prove ΔWPX is congruent to ΔZPY?

Given: $\angle 1 \cong \angle 2$

$\overline{WX} \cong \overline{ZY}$
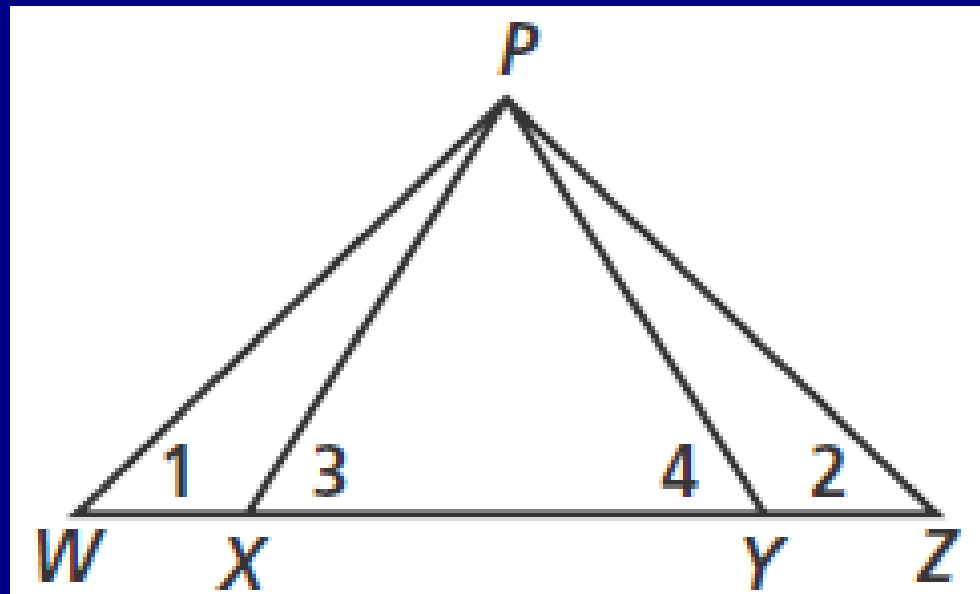


- SAS

# 1 - $500

- Triangle ABC ~ Triangle PQR

A = -8x-10y, B = 2, P = 24, and Q = 6x+5y

What is x and y?

- X = 7, y = -8

# 2 - $100

- Use the discriminant to identify the number and type of roots that the function
$$9n^2 - 3n - 8 = -10 \quad \text{has.}$$

- -63;     two imaginary solutions

# 2 - $200

- Factor $16x^4 - 1$

- $(2x - 1)(2x + 1)(4x^2 + 1)$

# 2 - $300

- Find the x and y intercepts of 7x – 2y = -14

- (0, 7) and (-2, 0)

- Solve $2m^2 - 7m - 13 = -10$

$$\left\{ \frac{7 + \sqrt{73}}{4}, \frac{7 - \sqrt{73}}{4} \right\}$$

# 2 - $500

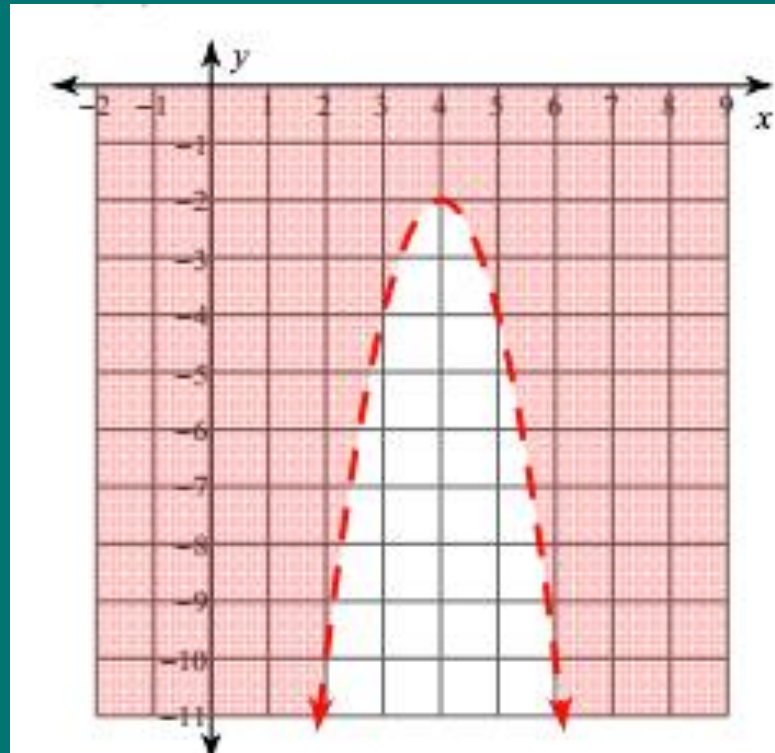- Name one solution to the inequality
Y > -2x² + 16x – 34 . (Hint: solve by graphing)



- Any point in the shaded region

- Simplify

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

$$-30 + 13\sqrt{5}$$

Q: The weight of a person varies inversely as the square of the distance from the center of the earth. If the radius of the earth is 400 miles, a person would weigh 180 pounds. How much would someone weigh that is 200 miles above the surface of the earth?

- **w = 28,800,000/d² ; 720 pounds**

# 3 - $300

Simplify: $5\sqrt[3]{2y} - \left(\sqrt[3]{54y} - \sqrt[3]{16}\right)$.

$$5\sqrt[3]{2y} - \left(\sqrt[3]{54y} - \sqrt[3]{16}\right) = 5\sqrt[3]{2y} - \sqrt[3]{54y} + \sqrt[3]{16}$$

$$= 5\sqrt[3]{2y} - \sqrt[3]{3^3 \cdot 2y} + \sqrt[3]{2^3 \cdot 2}$$

$$= 5\sqrt[3]{2y} - 3\sqrt[3]{2y} + 2\sqrt[3]{2}$$

$$= 2\sqrt[3]{2y} + 2\sqrt[3]{2}$$

- **Find the domain and range of**

$$y = \sqrt{x - 2} - 1$$

- Domain:  [2, ∞)          (or  x ≥ 2  )
- Range:     [-1, ∞)        (or  y ≥ -1 )

# 3 - $500

- Are the following functions inverses? Why?

$$f(n) = 2(n-2)^3$$
$$g(n) = \frac{4 + \sqrt[3]{4n}}{2}$$

- Yes because if you were to switch the x and y (or the n and f(n)), you would receive the other function

# 4 - $100

- How does the quadratic $f(x) = -(x + 2)^2 - 5$ translate from its parent graph?

- Reflects over the x-axis
- Translates to the left 2
- Translates down 5

■ **Find the domain and range of**

$$y = \sqrt[3]{x + 4} - 5$$

■ Domain:  $(-\infty, \infty)$         (or All real numbers)
■ Range:     $(-\infty, \infty)$        (or All real numbers)

# 4 - $300

- Find the new points after a

rotation 90° clockwise about the origin
$S(1, -4)$, $W(1, 0)$, $J(3, -4)$

- S'(-4, -1), W'(0, -1), J'(-4, -3)

# 4 - $400

- The shape ABC was transformed through 2 vectors: <-2, 5> and <5, -7>.  Write these two vectors as one, then describe this transformation in words.


- <3, -2>
- Shape ABC will be translated 3 units right and 2 units down

Write an equation for the translation of $y = \dfrac{5}{x}$

that has the asymptotes x = 8 and y = 12. Also, find the domain of the translated equation.

- **Equation:** $y = \dfrac{5}{x - 8} + 12$

- **Domain:** $(-\infty, 8) \cup (8, \infty)$

# 5 - $100

- A straight road to the top of a hill is 3000 feet long and makes an angle of 16 degrees with the horizontal.  What is the height of the hill?

- **826.9 feet**

  **(  do Sin(16) = x/3000**

  **x = 3000sin(16)   ).**

- **Solve.** **Express your answer using interval notation.**

$$2x^2 + 5x < 12$$
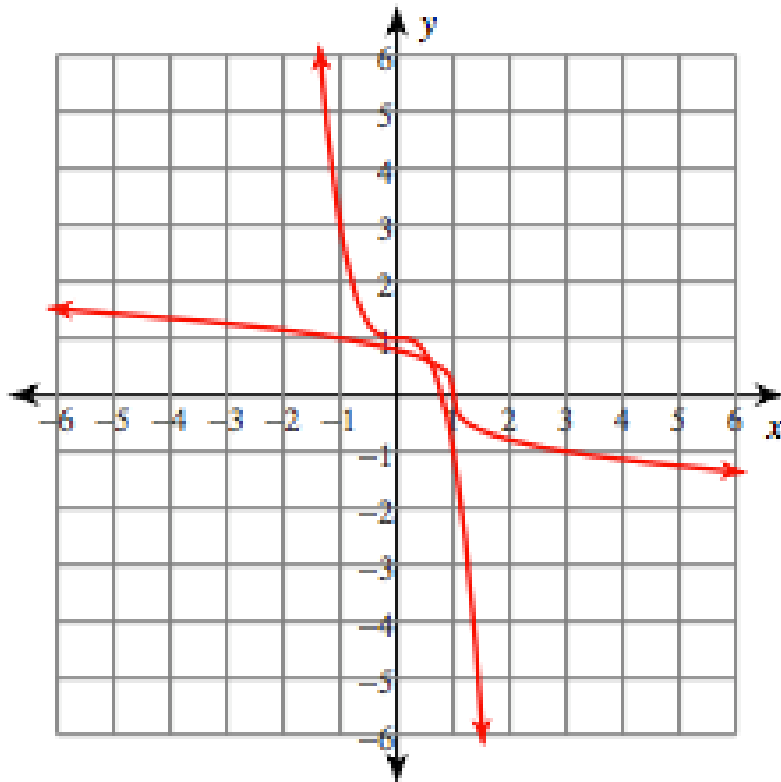
- (-4, 3/2)

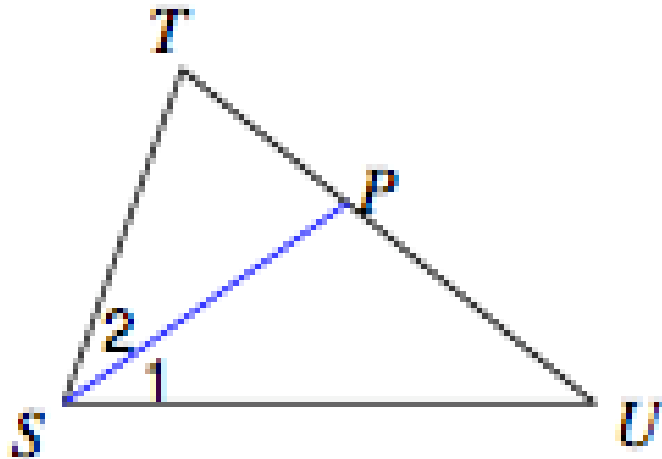- Find the inverse of $y = -2x^3 + 1$, then sketch both the original and the inverse function

$$f^{-1}(x) = \sqrt[3]{\frac{-x+1}{2}}$$

Find $m\angle UST$ if $m\angle 2 = 6x - 1$ and $m\angle UST = 10x + 10$.

And Segment SP is an angle bisector



- 70°

# 5 - $500

- A dog is 109 inches from a tree, barking at a cat up the tree.  The cat is 134 inches from the dog.  What is the angle of depression from the cat to the dog?

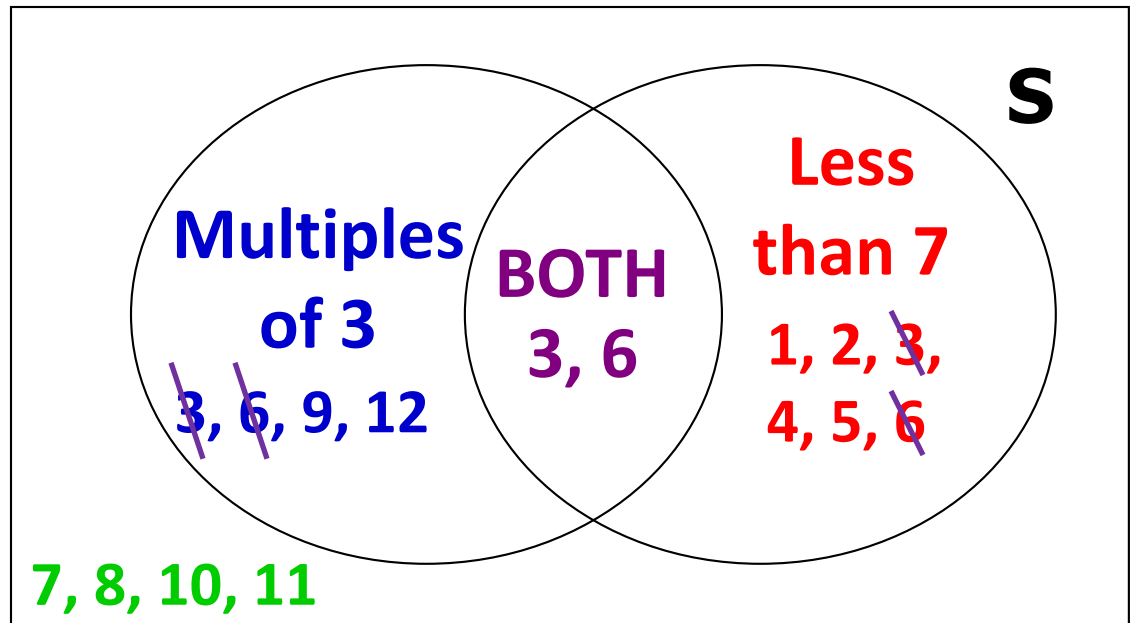- 35.6 degrees

# Extra Warm-Ups & Practice

# Warm Up Answers

2. The numbers 1 through 12 are placed in a hat and a number is drawn at random. What is the probability of choosing a number that is a multiple of 3 or less than 7?

**Remember,**
**P(A or B) =**
**P(A) + P(B) − P(A ∩ B)**

**\*\*Use this for both Mutually Exclusive and Inclusive events\*\***



**S**

**Multiples of 3**
**3, 6, 9, 12**

**BOTH 3, 6**

**Less than 7**
**1, 2, 3, 4, 5, 6**

**7, 8, 10, 11**

**P(multiple of 3 OR  # < 7)**
**= P(multiple of 3) + P(# < 7) − P(multiple of 3 ∩ # < 7)**
**= 4/12 + 6/12 − 2/12  =  8/12  = 2/3**