Key

Core Integrated Math 2

FINAL EXAM

REVIEW

2nd Semester, 2015-2016

KC5-KC9

Name:	Teacher:	Period:

2016 MAY						
SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26 FINALS 1, 3	27 FINALS 2, 4	28
29	30 NO SCHOOL	31 FINALS 6, 5				

Target 5A: Determine the model that would best represent a data set and analyze residual plots from the data to determine if the function is an appropriate fit.

1. Determine which kind of function best models the data.

Quadratic

x	$f(x)$	
−2	12	> -3
−1	9	> -1
0	8	> +1
1	9	> +3
2	12	> +5
3	17	

> +2
> +2
> +2
> +2

OR Plot data using graphing calculator

2. When finding the best fit linear equation, which of the following are we trying to MINIMIZE?

A. The range of the residuals
B. The sum of the squares of the residuals
C. The sum of the dependent variable
D. The sum of the residuals

B

3. Determine which kind of function best models the data.

Exponential

x	y	
−2	$\frac{1}{64}$	> x 8
−1	$\frac{1}{8}$	> x 8
0	1	> x 8
1	8	> x 8
2	64	

OR Plot data using graphing calculator

Target 5B: Interpret the key features of quadratic and exponential functions, represented graphically.

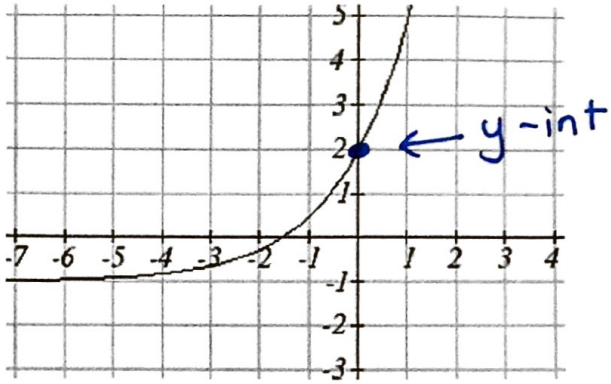
4. Answer the questions below in regards to key features of a graph:

a) Is the function INCREASING or DECREASING?

(goes up from left to right)

b) Identify the y-intercept:

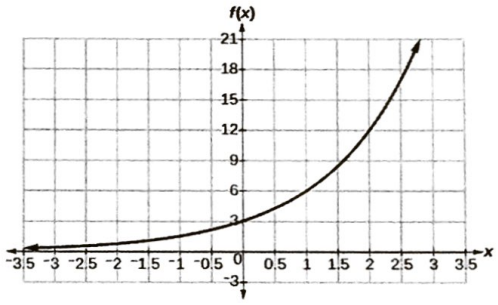
$y = 2$



5. Describe the END BEHAVIOR of the graph below.

As $x \to -\infty$, $f(x) \to +\infty$ (Left)

As $x \to +\infty$, $f(x) \to 0$ (Right)



Target 5C: Use graphs and tables to compare the output values of linear, quadratic, and exponential functions and compare properties of two differently* represented functions. (*algebraically, graphically, numerically in tables, or by verbal descriptions).

6. Select the function that has the GREATEST y-intercept.

Function f_A

$y = 2$

Greatest

$f_A = 3^x + 1$

(graph it!)

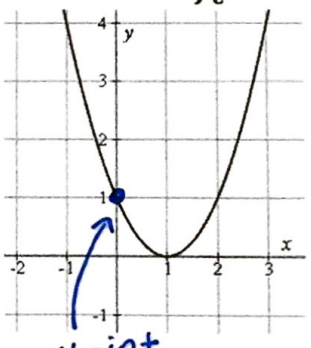
Function f_B

$y = -5$

x	−2	−1	0	1	2
$f(x)$	7	0	−5	−8	−9

y-int when $x = 0$

Function f_C



$y = 1$

y-int

7. Determine the function that has the greatest output value (y) when $x = -4$.

plug in −4 for x

$f_A = 2x + 13$

$= 2(-4) + 13$

$= 5$

$f_B = 4^x$

$= 4^{-4}$

$= \frac{1}{256}$

$f_C = x^2 - 3x + 14$

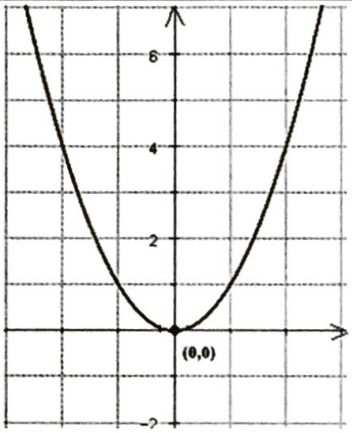
$= (-4)^2 - 3(-4) + 14$

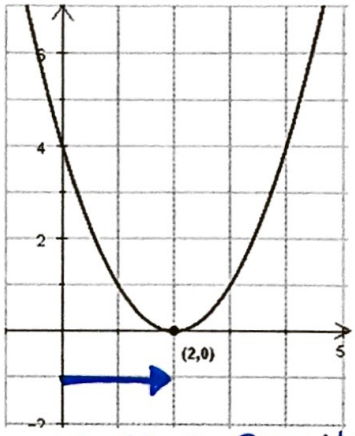
$= 42$ Greatest

Target 5D: Transform graphs based on changes in equations and write equations based on a translation of a parent graph.

8. Identify the transformation from Graph A to Graph B. Write the function of Graph B in the space provided.

Graph A	Graph B
$f(x) = x^2$	$f(x) = (x-2)^2$





$f(x) = a(x-h)^2 + k$

Shifted 2 units right and didn't shift up.

9. Describe the transformation of $f(x) = 4^{(x-3)}$ from the parent function $f(x) = 4^x$.

Translated (shifted) 3 units to the RIGHT

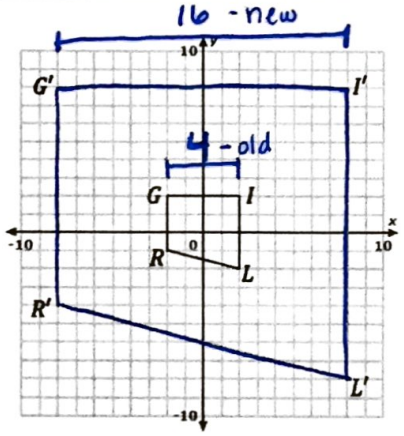
10. Transform the parent function $f(x) = x^2$ by shifting 6 units down and 4 units right.

$f(x) = (x-4)^2 - 6$

Target 6A: Understand similarity in terms of transformations in the coordinate plane.

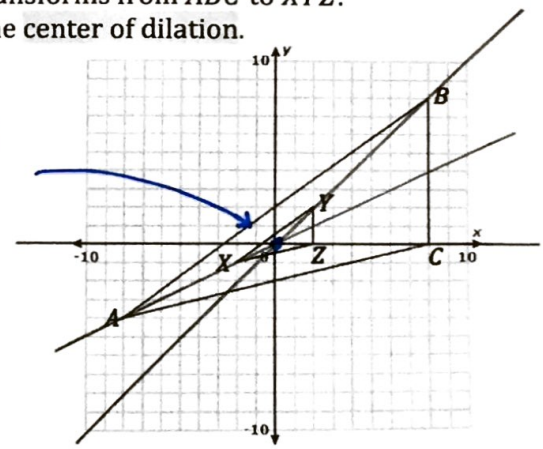
11. Determine the scale factor from $GIRL$ to $G'I'R'L'$.

$sf = \frac{new}{old} = \frac{16}{4} = 4$



12. The figure transforms from ABC to XYZ. Determine the center of dilation.

Center of dilation at (0,0)



Target 6B: Determine that two figures are similar using AA, SSS, and SAS similarity by verifying that angle measure is preserved and corresponding sides are proportional and use to make conclusions.

13. Determine if the triangles are similar. If they are not similar, write "Not Possible."

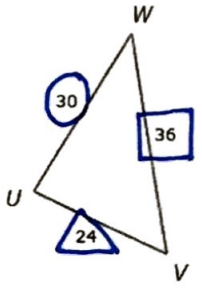
$\frac{36}{54} = \frac{2}{3}$

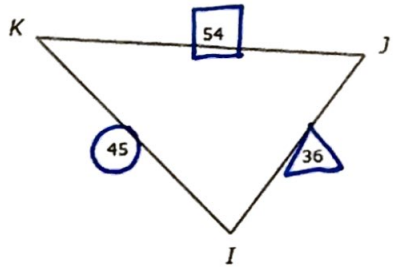
$\frac{30}{45} = \frac{2}{3}$

$\frac{24}{36} = \frac{2}{3}$

Similar by

SSS ~



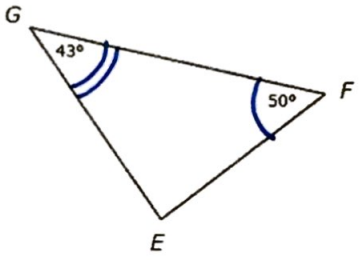


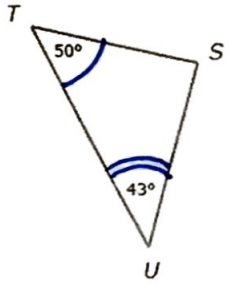
14. Determine if the triangles are similar. If they are not similar, write "Not Possible."

$\angle F \cong \angle T$

$\angle G \cong \angle U$

Similar by AA~



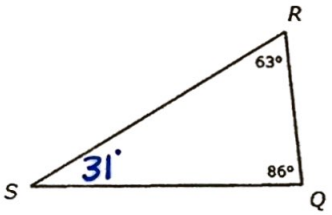


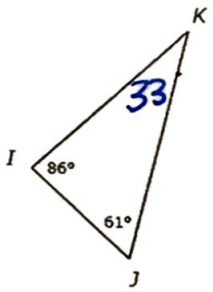
15. Determine if the triangles are similar. If they are not similar, write "Not Possible."

$180 - 63 - 86 = 31°$

$180 - 61 - 86 = 33°$

Not Possible





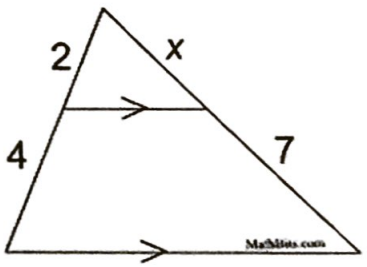
Target 6C: Apply theorems, postulates, or definitions to find missing values.

16. Find the value of x.

$\frac{2}{4} \times \frac{x}{7}$

$\frac{4x}{4} = \frac{14}{4}$

$x = \frac{7}{2}$ or $x = 3.5$



17. Find the value of x.

$\frac{15}{15-x} \times \frac{16}{10}$

$16(15-x) = 150$

$240 - 16x = 150$

$-240 \quad -240$

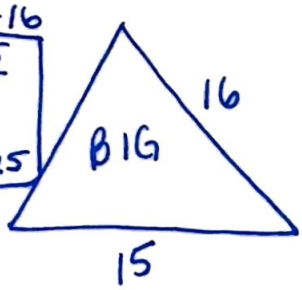
$-16x = -90$

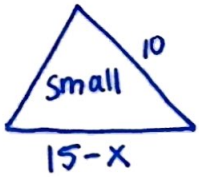
$\frac{-16x}{-16} = \frac{-90}{-16}$

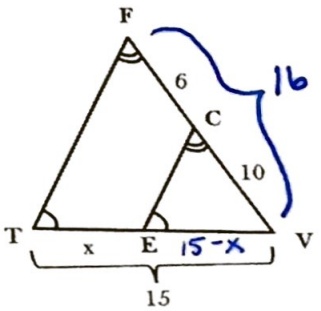
$x = \frac{45}{8}$

or

$x = 5.625$







18. Given $\Delta ABC \sim \Delta DEF$, solve for x.

$\frac{4}{x-6} = \frac{2}{3}$

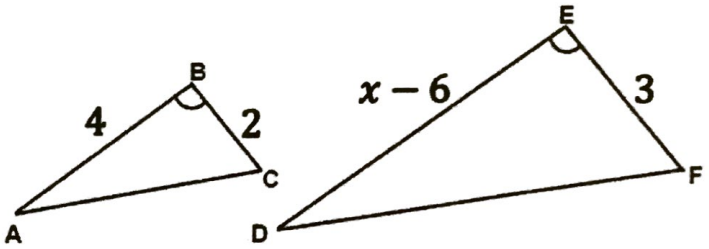
$2(x-6) = 12$

$2x - 12 = 12$

$+12 \quad +12$

$\frac{2x}{2} = \frac{24}{2}$

$x = 12$



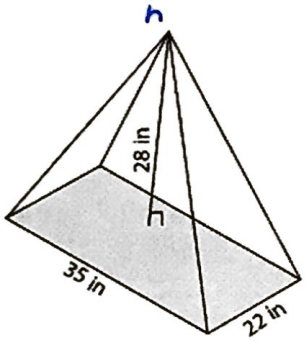
Target 6D: Calculate the base area and volume of prisms, cylinders, pyramids, and cones.

19. Calculate the volume of the square pyramid.
$Volume = \frac{1}{3}(area\ of\ base) \cdot height\ of\ pyramid$

$V = \frac{1}{3} \cdot \ell \cdot w \cdot h$

$V = \frac{1}{3}(35)(22)(28)$

$V = 7186.67\ in^3$

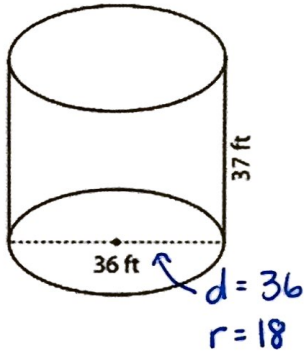


20. Calculate the base area of the cylinder. $Area_{\odot} = \pi r^2$

$A = \pi r^2$

$A = \pi(18)^2$

$A = 324\pi\ ft^2$

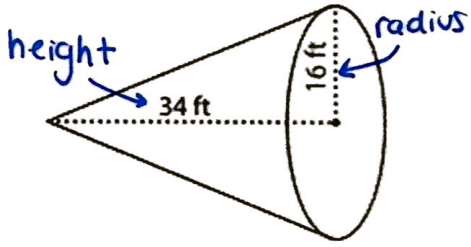


21. Calculate the volume of the cone. $Volume = \frac{1}{3}(\pi r^2) \cdot height\ of\ cone$

$V = \frac{1}{3}\pi r^2 \cdot h$

$V = \frac{1}{3}\pi(16)^2 \cdot 34$

$V \approx 9114.81\ ft^3$



Target 7A: Use Pythagorean Theorem to find missing sides of right triangles in application problems.

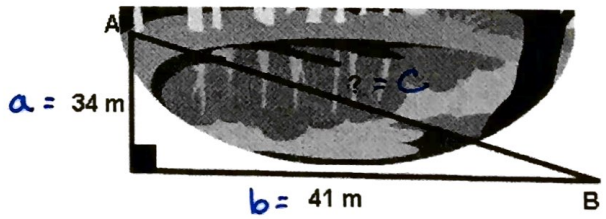
22. How many meters would it take to walk from Point A to Point B if it were possible to walk through the pond? Round your answer to the nearest hundredth. $a^2 + b^2 = c^2$

$34^2 + 41^2 = c^2$

$2837 = c^2$

$\sqrt{2837} = \sqrt{c^2}$

$c \approx 53.26\ m$



23. Find the height that the ladder reaches. Round your answer to the nearest hundredth. $a^2 + b^2 = c^2$

$21^2 + b^2 = 35^2$

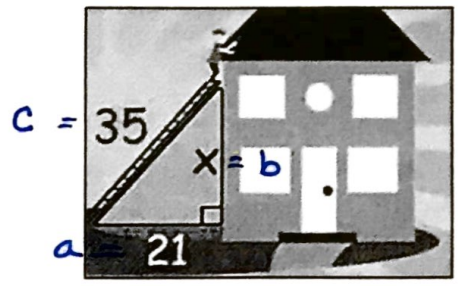
$441 + b^2 = 1225$

$-441 \quad -441$

$b^2 = 784$

$\sqrt{b^2} = \sqrt{784}$

$b = 28 \longrightarrow$ **$x = 28$**



24. Find the height of the iPod mini. Round your answer to the nearest hundredth. $a^2 + b^2 = c^2$

$1.6^2 + b^2 = 3.848^2$

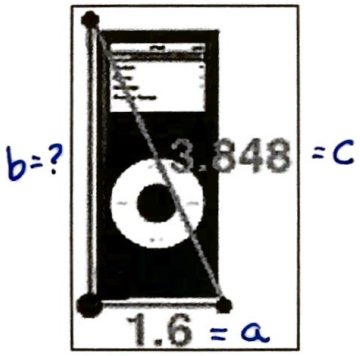
$2.56 + b^2 = 14.8071$

$-2.56 \quad -2.56$

$b^2 = 12.2471$

$\sqrt{b^2} = \sqrt{12.2471}$

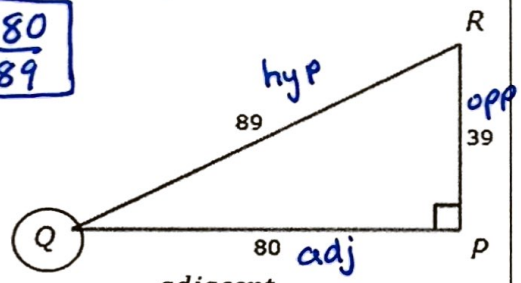
$b \approx 3.50$



Target 7B: Define the trigonometric ratios for acute angles in a right triangle and calculate sine, cosine, and tangent ratios when given two side lengths.

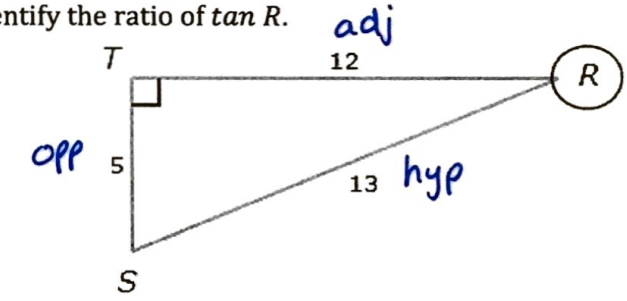
25. Identify the ratio of *cos Q*.

$\cos Q = \frac{80}{89}$



$$cos = \frac{adjacent}{hypotenuse}$$

26. Identify the ratio of *tan R*.

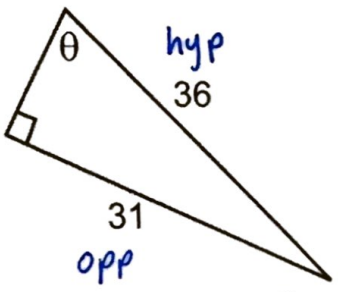


$$tan = \frac{opposite}{adjacent}$$

$\tan R = \frac{5}{12}$

27. Identify the ratio of *sin θ*.

$\sin\theta = \frac{31}{36}$



$$sin = \frac{opposite}{hypotenuse}$$

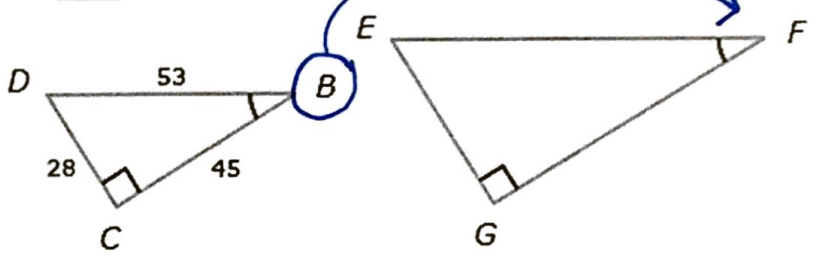
Target 7C: Use the characteristics of similar figures to justify the trigonometric ratios.

28. $\Delta CDB \sim \Delta GEF$. The $\cos B = \frac{45}{53}$. What is the ratio of $\cos F$?

corresponding angles of similar Δ's have the same ratios

$\cos F = \cos B$

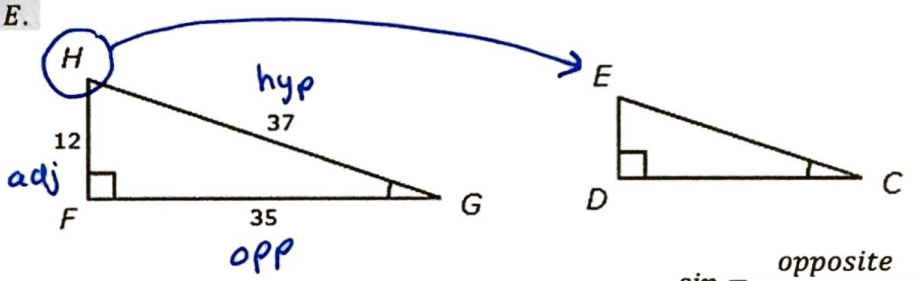
$\cos F = \frac{45}{53}$



29. $\Delta FGH \sim \Delta DCE$. Identify the ratio of $\sin E$.

$\sin E = \sin H$

$\sin E = \frac{35}{37}$



$$sin = \frac{opposite}{hypotenuse}$$

Target 7D: Use trigonometry to solve for missing sides and angles of right triangles.

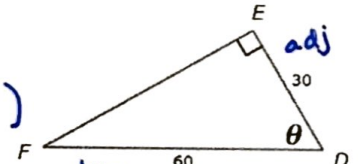
30. Solve for θ.

$\cos\theta = \frac{30}{60}$

$\cos^{-1}(\cos\theta) = \cos^{-1}\left(\frac{30}{60}\right)$

$\theta = \cos^{-1}\left(\frac{30}{60}\right)$

$\theta = 60°$



$$cos = \frac{adjacent}{hypotenuse}$$

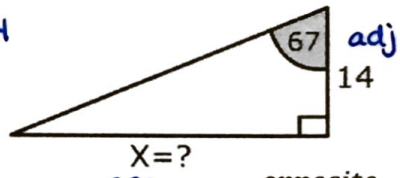
Note: Make sure your calculator is set to degrees!!!

31. Solve for x.

$14 \cdot \tan(67°) = \frac{x}{14} \cdot 14$

$14 \cdot \tan(67°) = x$ (calc)

$x \approx 32.98$



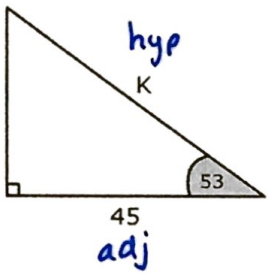
$$tan = \frac{opposite}{adjacent}$$

32. Solve for K.

$K \cdot \cos(53°) = \frac{45}{K} \cdot K$

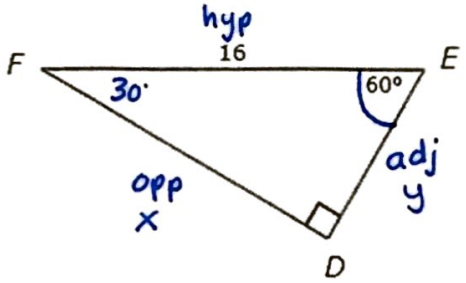
$\frac{K \cdot \cos(53°)}{\cos(53°)} = \frac{45}{\cos(53°)}$ } calc

$K \approx 74.77$



$$cos = \frac{adjacent}{hypotenuse}$$

Target 7E: Solve right triangles by finding the measures of all sides and angles.



33. Solve for $\angle F$:

$180 - 60 - 90 = \boxed{30^\circ}$

34. Solve for $\overline{DF}$:

(x)

$\frac{16}{1} \cdot \sin(60^\circ) = \frac{x}{16} \cdot 16$

$16 \cdot \sin(60^\circ) = x$

calc

$\boxed{x \approx 13.86}$

35. Solve for $\overline{DE}$:

(y)

$\frac{16}{1} \cdot \cos(60^\circ) = \frac{y}{16} \cdot 16$

$16 \cdot \cos(60^\circ) = y$

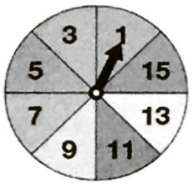
calc

$\boxed{y \approx 8}$

Target 8A: Use a sample space to describe events as subsets of that sample space and determine if two events are independent utilizing probability tests.

36. Identify the sample space.

$\{1, 3, 5, 7, 9, 11, 13, 15\}$



37. Which of the following events would **NOT** represent independent probability?

↳ which is dependent?

A. Students in a composition class may select certain topics on which to write an essay. Repeats are allowed, and they do not need to inform the teacher of their choice prior to the due date of the essay.

B. In history class, Hallie has to select a historical figure to dress up as. Then Rosie will select one, too. There are no repeats allowed. ← without replacement

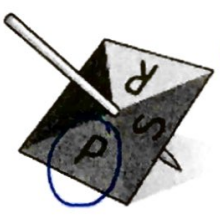
C. Alex took a coin out of her pocket and flipped it. Then she flipped it again.

Target 8B: Use the rules of probability to compute probabilities of compound events in a uniform probability model.

38. Determine the probability of spinning a letter P AND picking a consonant.

$P(\text{spinning P and picking consonant}) = \left(\frac{1}{4}\right)\left(\frac{3}{4}\right)$

$= \boxed{\frac{3}{16}}$



$P(p) = \frac{1}{4}$

$P(\text{consonant}) = \frac{3}{4}$

39. A spinner is spun 4 times, and the outcomes are documented. What is the probability that the first spin is a 2 AND the fourth spin is a 4?

↑ both!

$\frac{2}{12} = \boxed{\frac{1}{6}}$

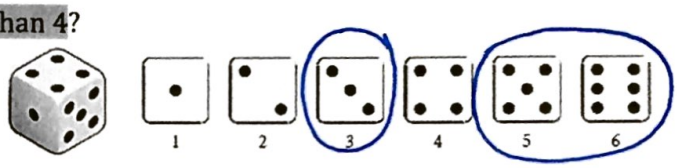
1234	2334	3214	4213
3324	4343	1123	3213
4443	3113	2214	1332

12 total outcomes

40. What is the probability of rolling a 3 OR a number greater than 4?

↓ Add

$\frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \boxed{\frac{1}{2}}$



Target 8C: Construct and interpret a two-way frequency table.

41. How many randomly chosen art students preferred drawing Plants by using Chalk as their medium?

$\boxed{4}$

	Plant	Insect	Totals
Acrylic paint	2	1	3
Chalk →	4	2	6
Totals	6	3	9

42. What is the probability that a randomly selected box of cereal contains two prizes?

$\boxed{\frac{5}{11}}$

	One prize	Two prizes	Totals
Mini size	3	2	5
Jumbo size	3	3	6
Totals	6	5	11

43. What is $P(\textit{reads 3 hours per week} \mid \textit{prefers paperback books})$?

$P(A|B) = \frac{P(A \cap B)}{P(B)}$

$\frac{P(\text{3 hours \& paperback})}{P(\text{paperback})} = \frac{6}{9} = \boxed{\frac{2}{3}}$

	E-readers	Paperback books	Totals
1 hour per week	5	3	8
3 hours per week	1	6	7
Totals	6	9	15

Target 8D: Demonstrate understanding by calculating conditional probability and independence using everyday examples of events based on the context of the problem.

44. The probability that a person has blonde hair is 0.20. The probability that they have blonde hair AND have a blue car is 0.18. Find the probability that a person has a blue car, GIVEN that they have blonde hair.

$$P(blue\ car|blonde\ hair) = \frac{P(blue\ car\ and\ blonde\ hair)}{P(blonde\ hair)} = \frac{0.18}{0.20} = \boxed{0.90}$$

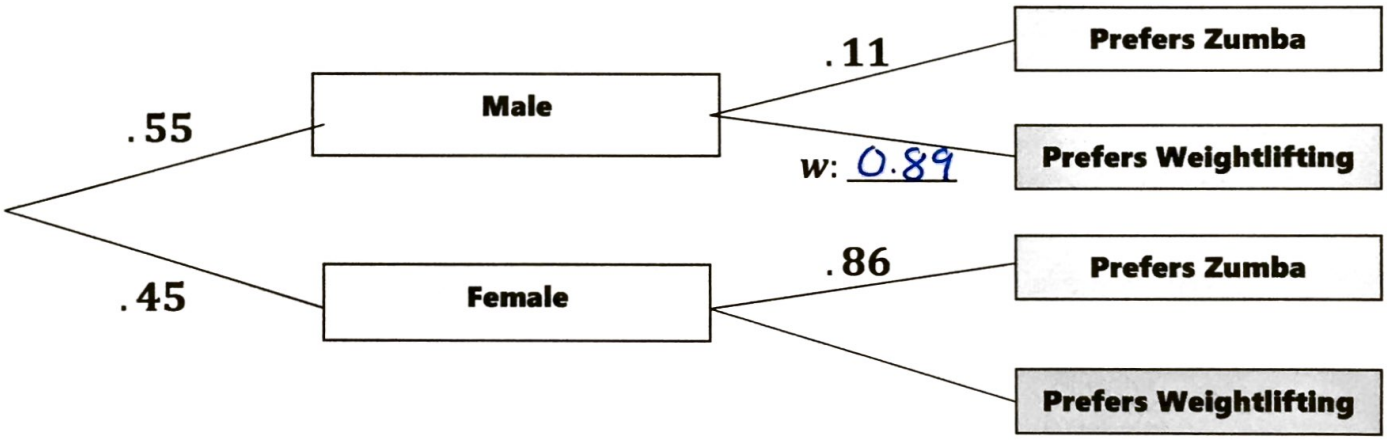
45. The probability that a person has knee pain is 0.59. The probability that they have knee pain AND is a male is 0.54. Find the probability that a person is a male, GIVEN that they have knee pain.

$$P(male|knee\ pain) = \frac{P(male\ and\ knee\ pain)}{P(knee\ pain)} = \frac{0.54}{0.59} = \boxed{0.92}$$

46. 6 out of 10 job openings are in retail. If four job openings are chosen at random WITH replacement, what is the probability that all four job openings will be in the retail industry?

$$\frac{6}{10} \cdot \frac{6}{10} \cdot \frac{6}{10} \cdot \frac{6}{10} = \frac{1296}{10000} = \boxed{\frac{81}{625}}$$

Target 8E: Compute probabilities of independent, dependent and compound events and use these to interpret data.



47. On the tree diagram, which decimal should be placed in the blank space labeled "*w*"?

$1 - 0.11 = \boxed{0.89}$

48. Explain what the probability of *w* represents.

The probability of preferring weightlifting GIVEN you are Male.

49. Find $P(Female\ AND\ Prefers\ Zumba)$.

$P(Female) \cdot P(Zumba) = 0.45 \cdot 0.86 = \boxed{0.387}$

Target 9A: Prove that circles are similar.

50. Show the two given circles are similar by stating the necessary transformations from $\odot F$ to $\odot S$.

$\odot F$: center $(-8, 6)$ radius 2 $\odot D$: center $(1, 1)$ radius 8

old New

x y old x y New

$-8 \xrightarrow{\text{to}} 1$

Shifts 9 units Right

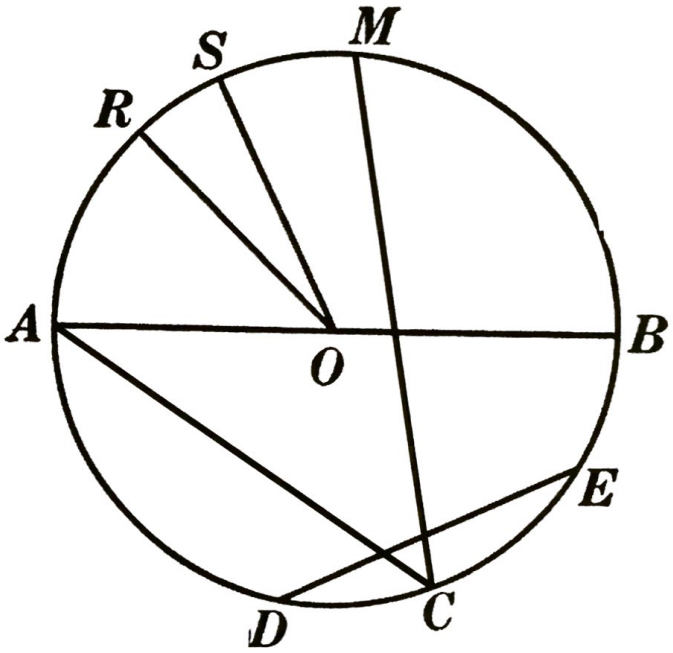
$6 \downarrow 1$

Shifts 5 units Down

Scale Factor: $\frac{\text{new}}{\text{old}} = \frac{8}{2} = 4$

Target 9B: Identify and describe relationships among central angles, inscribed angles, radii, and chords.

Use the figure at the right to answer questions #41 – 43 where O is the center.



51. Identify which of the following is an inscribed angle.

A. $\measuredangle SOR$ (central)
B. $\measuredangle MCA$ (inscribed)
C. $\measuredangle ARS$ (arc)

52. Identify which of the following is a chord.

A. $\overline{SO}$ (radius)
B. $\overline{DE}$ (chord)
C. Both A and B

53. Identify which of the following is a major arc.

A. $\overset{\frown}{ARM}$ (minor)
B. $\overset{\frown}{ACB}$ (semi circle)
C. $\overset{\frown}{ADM}$ (major)

DIDN'T COVER #54-58

Target 9C: Apply the formula for arc length and area of a sector of a circle and calculate using the radius and/or the measure of the central angle.

54. Convert 240° to radians. $Radians = degrees \cdot \frac{\pi}{180}$

$240^\circ \cdot \frac{\pi}{180} = \frac{240\pi}{180} = \frac{4\pi}{3}$ (reduce w/out π)

55. A round pizza with a 20" diameter is cut into 4 congruent slices. What is the area of one slice/sector? (in terms of π) $Area_{circle} = \pi r^2$

$r = 10"$

Find area and divide by 4

$A_{slice} = \frac{\pi r^2}{4} = \frac{\pi(10)^2}{4} = \frac{100\pi}{4} = 25\pi$

Target 9D: Given the equation of the circle, use the method of completing the square to determine the coordinates of the center and radius of the circle.

56. Use completing the square to find the center and radius of the circle.

$$x^2 + y^2 + 4y - 12 = 0$$
$$x^2 + y^2 + 4y = 12$$
$$x^2 + y^2 + 4y + \underline{4} = 12 + \underline{4}$$

$\frac{4}{2} = 2$, $(2)^2 = 4$

$x^2 + (y+2)^2 = 16$

Center: $(0, -2)$ radius $= \sqrt{16} = 4$

57. Use completing the square to find the center and radius of the circle.

$$x^2 - 2x + y^2 - 80 = 0$$
$$x^2 - 2x + y^2 = 80$$
$$x^2 - 2x + \underline{1} + y^2 = 80 + \underline{1}$$

$\frac{-2}{2} = -1$, $(-1)^2 = 1$

$(x-1)^2 + y^2 = 81$

Center: $(1, 0)$ radius $= \sqrt{81} = 9$

58. Use completing the square to find the center and radius of the circle.

$$x^2 + y^2 + 2x - 24y + 120 = 0$$
$$x^2 + 2x + y^2 - 24y + 120 = 0$$
$$x^2 + 2x + y^2 - 24y = -120$$
$$x^2 + 2x + \underline{1} + y^2 - 24y + \underline{144} = -120 + \underline{1} + \underline{144}$$

$\frac{2}{2} = 1$, $(1)^2 = 1$

$\frac{-24}{2} = -12$, $(-12)^2 = 144$

$(x+1)^2 + (y-12)^2 = 25$

Center: $(-1, 12)$ radius $= \sqrt{25} = 5$