Algebra 2 ~ 10.1-10.3 Review Name Key

1. In a photography exhibit, 6 photographs will be displayed in a row along one wall.

a. How many different ways can the photographs be displayed?

$6! = 720$ ways

b. How many different ways can 3 of the photographs receive first prize, second prize, and honorable mention?

${}_6P_3 = 120$ ways

2. You want to make a fruit smoothie using 3 of the fruits listed below. How many different smoothies can you make?

orange, strawberry, banana, pineapple, kiwi, watermelon, cantaloupe, peach

${}_8C_3 = 56$ smoothies

3. A code has 5 digits in a specific order. The digits can be 0-7. How many codes are possible if one digit may only be used once?

8

${}_8P_5 = 6{,}720$ codes or $8 \cdot 7 \cdot 6 \cdot 5 \cdot 4$

4. You must take 18 elective courses to meet your graduation requirements for college. There are 30 courses that you are interested in. How many different course selections are possible?

${}_{30}C_{18} = 86{,}493{,}225$ selections

5. A password consists of 3 letters and 2 digits. Which password is more secure, one in which letters and digits can be reused or one in which they cannot be reused? Show each case and then explain.

$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 = 1{,}757{,}600$

letters digits

$26 \cdot 25 \cdot 24 \cdot 10 \cdot 9 = 1{,}404{,}000$

*reused more secure

6. How many distinguishable arrangements of the letters in the word TENNESSEE exist?

9 letters
4 E's, 2 N's, 2 S's

$\frac{9!}{4!2!2!} = 3{,}780$ dist. arrmts

7. Use Pascal's triangle to expand $(2x - 5)^4$. What is the coefficient of the x^3 term?

$1(2x)^4(-5)^0 \quad 4(2x)^3(-5)^1 \quad 6(2x)^2(-5)^2 \quad 4(2x)^1(-5)^3 \quad 1(2x)^0(-5)^4$

$16x^4 - 160x^3 + 600x^2 - 1000x + 625$

coefficient of x^3 term: -160

8. You have an equally likely chance of choosing any integer from 1 to 25. Find the probability of the given event:

a. A number strictly less than 10 is chosen

1–9

$\frac{9}{25}$

b. A multiple of 3 is chosen

3, 6, 9, 12, 15, 18, 21, 24

$\frac{8}{25}$

c. A prime number is chosen

2, 3, 5, 7, 11, 13, 17, 19, 23

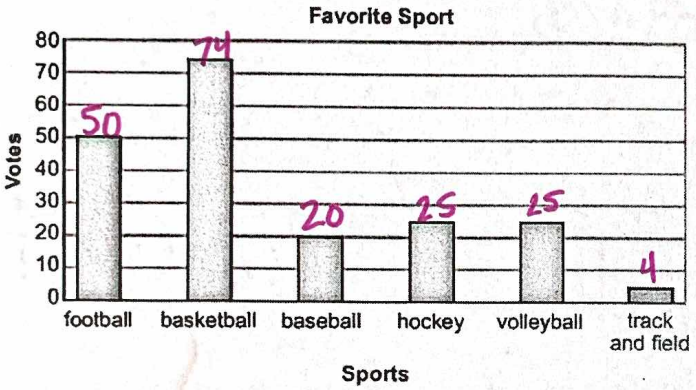
$\frac{9}{25}$

d. A number that has a digit that is 5 is chosen

5, 15, 25

$\frac{3}{25}$

9. The graph shows the results of a survey that asked 9th grade students which sport they would most like to watch on TV.



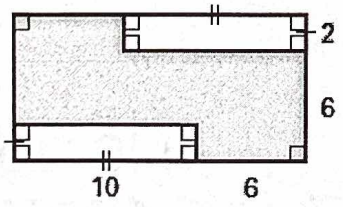
a. Find the probability that a randomly selected 9th grade student would like to watch track and field.

$\frac{4}{198}$ $\frac{2}{99}$ or .02

b. Is your answer from part (a) a theoretical or experimental probability? Explain.

Experimental, from a trial or experiment

10. Find the probability that a randomly chosen point in the figure lies in the shaded region.



$P(\text{shaded}) = \frac{\text{Area shaded}}{\text{total area}} = \frac{88}{128} = \frac{11}{16}$

.69

11. Simplify using a blue calculator only. Show all work.

a. $11!$ $= 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

39,916,800

b. ${}_8P_2$ $\frac{8!}{(8-2)!} = \frac{8 \cdot 7 \cdot \cancel{6!}}{\cancel{6!}} =$ 56

c. ${}_{10}C_5$ $\frac{10!}{(10-5)!5!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot \cancel{5!}}{\cancel{5!} \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} =$ 252

d. $0!$ $0! =$ 1