Math 172 Exam 3 Review

1. Experimental Probability is based on actually attempting experiments.
   Theoretical involves thinking about all possible outcomes.

2. \( \frac{1}{2} \)

3. \( 6 \times 10 = 60 \)

4. \( \frac{20}{64} = \frac{5}{16} \)

5. \( \frac{20}{64} = \frac{5}{16} \)

6. \( \frac{20}{64} = \frac{5}{16} \)

7. \( \frac{20}{64} = \frac{5}{16} \)

8. \( \frac{7}{9} \)

9. \( \frac{x + 2}{6 + x} = 6 + x = 2 \times 4 \) (Note: This seems to be a typographical error. The equation should be \( x + 2 = 6 + x \), which simplifies to \( x = 4 \)).

10. \( \frac{1}{5} = \frac{2}{6 + x} \) (Note: This equation is not consistent with the previous equation. It might be intended to be \( \frac{1}{5} = \frac{2}{6 + 4} \) which simplifies to \( x = 4 \)).

11. Diagram:
    - RWB
    - RWB
    - RWB

12. \( \frac{3}{12} \cdot \frac{5}{7} = \frac{15}{84} = \frac{5}{28} \)

13. \( \frac{3}{7} + \frac{4}{12} = \frac{7}{12} \)

14. 0

15. 1:9

16. 6:4 or 3:2

17. 2:8 or 1:4

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14. \( P(A|B) = \frac{\text{Probability of not prime given it is odd}}{\frac{1}{6}} = \frac{\frac{1}{2}}{\frac{1}{6}} \)

\( P(B|A) = \frac{\text{Probability of odd given it is not prime}}{\frac{1}{2}} = \frac{\frac{1}{2}}{\frac{1}{2}} \)

20. \( \frac{2625 \cdot 10 \cdot 9 \cdot 8}{2625 \cdot 10 \cdot 9 \cdot 8} = \frac{1}{650} \)

21. \( \binom{52}{13} = 635,013,559,600 \)

22. \( \frac{1}{635,013,559,600} \)

23. \( \frac{13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8}{635,013,559,600} = \frac{114,040,7300}{635,013,559,600} \)

24. \( P(A \cap B) = \text{Probability that a chosen student is both in a 10AM class and regularly eats breakfast} \)

\( P(A \cap B) = \frac{P(A \cap B)}{P(B)} = \frac{12}{24} = \frac{1}{2} \)

\( P(B) = \text{Probability that a student who regularly eats breakfast is also in a 10AM class} \)

\( P(B) = \frac{20}{24} = \frac{5}{6} \)

25. \( P(A \cup B) = P(A) + P(B) - P(A \cap B) = \frac{2}{3} + \frac{2}{3} - \frac{1}{2} = \frac{13}{10} \)

\( P(B) = \frac{1}{2} \)

26. \( 0 \cdot \frac{1}{3} + 10 \cdot \frac{2}{3} + 20 \cdot \frac{1}{3} = 10 \)

\( \frac{1}{3} \cdot \frac{2}{3} \cdot \frac{1}{3} \)
27. \[ P(D \mid N) = \frac{42}{212} \]

28. \[ P(D \mid D) = \frac{24}{99} \]

29. \[ P(D \mid d_a) = \frac{24}{30.3} \]

30. Answers may vary

31. Answers may vary

32. \[ \frac{50}{1000} \cdot 10 + \frac{10}{1000} \cdot 15 + \frac{5}{1000} \cdot 30 + \frac{1}{1000} \cdot 60 + \frac{93}{1000} \cdot 0 = 2.85 \]

33. \[ 1.35 \quad -1.35 + 2.85 = 2.50 \]

34. Income = $2000

Pretax = $850

Gain = $1150 \quad \text{or} \quad 1000 \times (2 - .85) \]