Math 302
Study Guide for Exam 3

Reminders for Fri. Test 5/1: No calculators or notes with a 55 minute time limit, and covers Sections 8.1 - 8.3, 9.1 - 9.3 that we have studied.

- Represent relations using an arrow diagram as well as ordered pairs
- Determine the rule for a function (Guess my rule)
- Interpret line graphs
- Find the distance between two points
- Compute the slope of line segments
- Write the equations of lines parallel and perpendicular to a given line through points provided
- Name lines, rays, line segments, angles using proper notation
- Classify and draw types of angles
- Describe van Hiele levels of geometric thinking and the phases to progress from one level to the next level
- Determine angle measures in drawings and real-life contexts
- Identify types of curves (such as simple, closed, polygonal, concave, convex)
- Determine the sum of the interior angles in polygons
- Draw 2-D and 3-D shapes
- Name parts of a polyhedron (edges, vertices, faces)

Practice 1 Tell whether the points are the vertices of a parallelogram (that is not a rectangle), a rectangle, or neither.

a) \((-10, -4), (7, -1), (13, -9), (7, 5)\)

\[ \text{slope } AD = \frac{5 - (-4)}{4 - (-10)} = \frac{9}{14} \]

\[ \text{slope } DC = \frac{5 - (-4)}{4 - 15} = \frac{-9}{11} \]

- Rectangle because opposite sides are parallel and adjacent sides are \( 9 \) units long.
Practice 2 Write algebraic expressions for the following:

a) Bobbie is $m$ years old. What is June's current age if she was half Bobbie's age three years ago?
\[ \frac{m-3}{2} + 3 \]

b) If one angle is $x$ degrees, what is the supplement of this angle?
\[ 180 - x \]

c) The cost of MSUM theater tickets are: $10 for students, $15 for alumni, and $20 for adults that are not alumni. How much does the theater collect for a show?
Let $x =$ # student tickets sold, $y =$ # alumni tickets sold, and $z =$ # adult tickets sold
\[ 10x + 15y + 20z \]

Practice 3 Name the following in as many ways as possible using proper notation:

a) \[ \overrightarrow{UT}, \overrightarrow{US} \]

b) \[ \angle ZNM, \angle MNZ \]

Practice 4 Describe the figures as completely as possible, using the properties simple, closed, polygonal curve, and polygon.

a) Closed Polygonal curve

b) Simple, closed Polygonal curve

c) Closed & Simple
Practice 5

Two points (0, 4) & (4, 3).

\[ M = \frac{4 - 3}{0 - 4} = \frac{1}{-4} = -\frac{1}{4} \]

a) Write the equation a line parallel to the line graphed above that passes through the point (6, -2).

\[ -2 = -\frac{1}{4} (6) + b \to -2 = -\frac{3}{2} + b \]

\[ -\frac{3}{2} + b \]

\[ -\frac{3}{2} = b \]

\[ y = -\frac{1}{4}x - \frac{1}{2} \]

b) Write the equation a line perpendicular to the line graphed above that passes through the point (-2, 1).

If the original slope = \(-\frac{3}{4}\)

Then the perpendicular slope = \(\frac{4}{3}\)

\[ y = 4x + b \]

\[ 1 = 4(-2) + b \]

\[ 1 = -8 + b \]

\[ 1 + 8 = b \]

\[ y = 4x + 9 \]

Practice 6 Find the missing angle or angles.

a)

b)

\[ 77^\circ \quad 77^\circ \quad 180 - \frac{2x}{154} \]

\[ 2x = 154 \]

\[ x = 77 \]

\[ 180 - (26 + 90) \]

\[ 180 - 116 = 64^\circ \]

\[ 26^\circ \]

\[ 64^\circ \]

\[ 90 \]

\[ 26 \]
Practice 7 Compute the i) slope and ii) distance between the given pair of points.

a) (4, 5) (-3, 8)

\[
\text{Slope } = \frac{8 - 5}{-3 - 4} = \frac{-3}{-7} = \frac{3}{7}
\]

\[
\text{Distance } \sqrt{(8-5)^2 + (4-3)^2} = \sqrt{9 + 1} = \sqrt{10}
\]

b) (7, 2) (1, 2)

\[
\text{Slope } = \frac{2 - 2}{7 - 1} = \frac{0}{6} = 0
\]

Practice 8 Solve the Guess My Rule below.

a) | Guess (x) | 4 | 2 | 0 | -3 |
   | Response | 18 | 6 | 2 | 11 |

\[x^2 + 2 \text{ or } x \cdot x + 2\]

b) | Guess (\cdot) | 7 | 8 | 10 | 11 |
   | Response | 4 | 5 | 7 | 8 |

\[x + 3 \text{ or } x - 3\]

Practice 9: Draw the following

a. An oblique pentagonal prism

b. A right circular cone