

Math-19 Homework #3

Reading

Please read sections 1.8 through 1.12 and do all concept problems in the posted sections on web-assign.

Problems

- 1). Solve for x . Remember, the answer should be a subset of the real numbers expressed in interval notation — not just single numbers.

$$\frac{x^{\frac{5}{2}} - 3x^{\frac{3}{2}} - 10x^{\frac{1}{2}}}{x^2 - 9x + 20} \geq 0$$

- 2). We want a circle whose diameter is the line segment between the points $(5, 4)$ and $(-3, -2)$. Using the distance and midpoint formulas:
- Determine the center of the circle.
 - Determine the radius of the circle.
 - What is the equation of the circle in standard form?
 - What is the equation of the circle in general form?
- 3). Find the equation of the line containing the diameter in question (2):
- In point/slope form.
 - In slope-intercept form.
 - In general form.
 - Find the equation of the line through the center of the circle and perpendicular to the line containing the stated diameter.
- 4). The amount of heat energy (Q) needed to change the temperature of an object (without going through a phase change like melting or boiling) is jointly proportional to the mass of the object (m) and the *change* in temperature (ΔT).
- Write an equation that models this physical phenomenon. Use c for the constant of proportionality.
 - The MKS unit for heat energy is the Joule (J). The constant of proportionality is specific to the substance being heated and is referred to as the *specific heat* of the substance. If Q is measured in Joules (J), m is measured in grams (g), and temperature is measured in Kelvin (K), what are the units of c ?
 - In the lab, it is found that $41790J$ of heat energy raises the temperature of $1L$ of water by $10K$. What is the specific heat of water? ($1L$ of water= $1000g$)

5). Consider the equation:

$$y = x^2 + 2x - 5$$

For each of the parts below, use the graphing functions under the *math* (TI-89) or *calc* (TI-83/84) menus to find the answer and submit a screen-shot from your calculator that shows the correct answer.

- a). Find the y -value when $x = 1.3$ using the *value* function.
- b). Find the x -intercepts using the *zero* function.
- c). Determine the minimum value using the *minimum* function.
- d). Determine the x -values for $y = 5$ using the *intersect* function. Note that you will need to add something to your graph to do this. Also note that there are multiple answers.
- e). Now graph the function $y = x^2 + 11$. Huh!? Nothing seems to appear! Why, and how can you fix this? Submit a screen shot that uses your fix.