

Quiz 7

Key

This is a two-stage quiz. During the first stage, use your knowledge & calculator to take this quiz. You have 15 min. In the second stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have 15 min. to write one solution (with everyone's name on it!!!) to be turned in for the group.

Show your work as you would for a *colleague*. Partial credit requires reasonable support.

- Extr. Prob §5.2 #11 [3] Suppose you need to drill a $\frac{3}{8}$ -inch hole, but the set of drill bits is measured in sixteenths of an inch. What size drill bit should you use? Provide some justification.

Start justify (+.5)
justify/sense (+1)
notation (+.5)

We need to find a fraction equivalent to $\frac{3}{8}$ inch (size of hole) with 16 in the denominator (bit measured in)

$$\frac{3}{8} = \frac{3 \cdot 2}{8 \cdot 2} = \frac{6}{16} \quad \text{so } \frac{6}{16} \text{th bit should work}$$

2. [2] Simplify the fraction as much as possible (if possible): $\frac{9a}{6+3a}$

Fraction Activity #4

$$\frac{9a}{6+3a} = \frac{3 \cdot 3 \cdot a}{3(2+1a)} = \frac{3}{1} \cdot \frac{3a}{2+a} = \frac{3a}{2+a}$$

factor numerator (+.5)
factor denominator (+.5)
canceling (+.5)
canceling no more (+.5)

3. [5] Perform the operations below. Leave answers in factored form and as *reduced* fractions. Assume all letters are real numbers and that no combination of symbols equal zero in the denominator.

§5.3 #14f
algorithm (+1)
reduced fraction (+1)

(a) $\frac{2}{3} \div \frac{1}{6} = \frac{2 \div 1}{3 \div 6} = \frac{2}{3/6} = \frac{2}{1/2} = 4$

OR keep-change-flip
 $\frac{2}{3} \times \frac{6}{1} = \frac{12}{3} = 4$

$\frac{1}{2} \times ? = 2$

(b) $\frac{1}{a} + \frac{3}{a+1}$

common denominator (+1)

add numerators (+1)

respect order of op / common terms (+1)

$$\frac{1(a+1)}{a(a+1)} + \frac{3 \times a}{a+1 \times a}$$

$$\frac{a+1+3a}{a(a+1)} = \frac{4a+1}{a(a+1)}$$

Method 2

§5.3 #18