Problems marked with * are more difficult.

1. Evaluate the following expressions (hint: try to use the most efficient way to do it, do some steps using decimals and other using normal fraction):
a. $\frac{\left(3 \frac{1}{3}: 10+2 \frac{1}{6}: 3.25\right): 0.125}{\frac{2}{13} \cdot 5.2+3 \cdot \frac{2}{13}+4.8 \frac{2}{13}} ;$ (Answer is 4 )
b. $\frac{1 \frac{3}{7}-\frac{1}{3}: 2.8 \cdot 3 \frac{3}{5}}{\left(2.375-\frac{1}{3}+1 \frac{1}{12}\right) \cdot 0.8} ;($ Answer is 0.4$)$
2. Simplify the following expressions (rewrite the expressions without parenthesis and combine like terms)
a. $7 a+(2 a+3 b)$;
b. $(5 x+7 a)+4 a$;
c. $3 m-(5 n+2 m)$;
d. $6 p-(5 p-3 a)$;
e. $48 a-(2 a-2 b)-(14 b-28 a)+(24 b-18 a)$;
f. $5-7 a-(8-6 a)+(5+a)$;
3. Among 100 university students 48 are studying English, 26 are studying French, 28 are studying German, 8 are studying English and German, 8 are studying English and French, 13 are studying French and German, 24 are not studying any language. How many students are studying all three languages?
4. Simplify:

$$
\begin{array}{lll}
\frac{x^{5} \cdot x^{8}}{x^{3}} ; & \frac{m^{20}}{m^{8} \cdot m^{8}} ; & \frac{b^{3} \cdot b \cdot b^{7}}{b^{5} \cdot b^{4}} \\
\frac{a^{90} \cdot a^{10}}{a^{50}} ; & \frac{y^{30}}{y^{15} \cdot y^{10}} ; & \frac{c^{12} \cdot c^{2} \cdot c^{6}}{c \cdot c^{10} \cdot c^{3}}
\end{array}
$$

$$
\frac{x^{n} \cdot x^{20}}{x^{10}}
$$

$$
\frac{a^{n} \cdot a^{n+2}}{a^{2 n}}
$$

$$
\frac{c^{8 n}}{c^{n} \cdot c^{4 n}}
$$

$$
\frac{y^{n+12}}{y^{n} \cdot y^{11}}
$$

5. Triangle ABC is a isosceles triangle. $|\mathrm{AB}|=|\mathrm{BC}|$. $\angle B A C+\angle B C A=52^{\circ}$ What is the measure of the angle $\angle B A C$ ?

6. In the triangle $\mathrm{DAC},|D E|=|E C|$, what is the measure of the angle $\angle F E C$, if the angle $\angle D E C=104^{\circ}$
7. Rewrite without parentheses.


Example: $(b+2)(2 b+3)=(b+2) \cdot 2 b+(b+2) \cdot 3=b \cdot 2 b+2 \cdot 2 b+3 \cdot b+3 \cdot 2=2 b^{2}+$ $4 b+3 b+6=2 b^{2}+7 b+6$
a. $(a+1)(a+1)$;
b. $(2+y)(y+3)$;
c. $(1+x)(1-x)$;
d. $(x-y)(x+y)$;
e. $(2 a+b)(a+2 b)$;

