

Calculus Exercises

split into factors:

(1.) $x^2 + 5x + 6$

(2.) $x^2 - x - 6$

(3.) $x^2 + x - 20$

(4.) $3x^2 - 24x + 45$

(5.) $2x^2 + 3x - 2$

(6.) Compute $\frac{100!}{97!}$

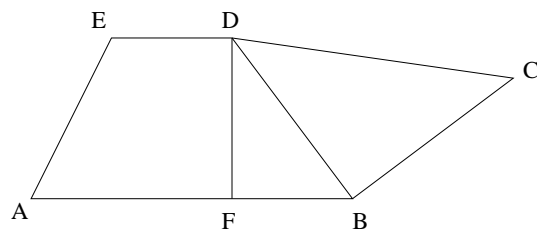
(7.) Simplify (for n even): $\frac{n!(n-2)!(n-4)! \dots 0!}{(n-1)!(n-3)! \dots 1!}$

(8.) Simplify $\sqrt[4]{(2^{1/3})^6(\sqrt{2})^{12}}$

(9.) Simplify $\exp(-\ln 4 - \ln 3)$

(10.) Find the center coordinates and radius of the circle $x^2 + y^2 - 4x + 6y = 12$

(11.) Given this figure and data



$$AB \parallel DE$$

$$AB = 8$$

$$DE = 3$$

$$DF = 4$$

$$AF = 5$$

$$\angle B \text{ (right)} = \angle F = 90^\circ$$

$$BC = BD,$$

compute the area $ABCDE$.

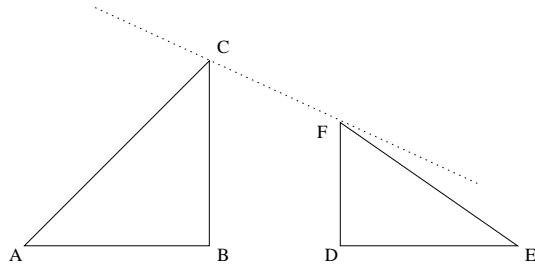
(12.) Compute the area of the triangle formed by the intersections of the lines:

$$l_1 : y = 1 + x$$

$$l_2 : y = 5 - x$$

$$l_3 : y = 3 - \frac{1}{2}x.$$

(13.) Give the equation of the line CF given



- $A = (0, 0)$
- $E = (16, 0)$
- $ABDE \parallel x\text{-axis}$
- $\angle A = \pi/4$
- $\angle B = \angle D = \pi/2$
- $\angle E = \pi/6$
- $BC = 6$
- $DF = 4.$

Compute the derivative of

(14.) $\sin(x) + \cos(x)$

(15.) $\sin(x) \cos(x)$

(16.) $\sin(\cos(x))$

Compute the extrema of

(17.) $f(x) = (x - 2)(x - 4)$

(18.) $f(x) = \sin(x) \cos(x)$, with $x \in [-\pi, \pi]$

(19.) What is the maximum area of a rectangle with circumference 8 and width x ?