

MAT126 – Technical Math & Trig

Assignment 5

Factor each of the following:

1. $2x^2 - 128$

5. $x^2 - 4x - 45$

2. $x^2 - 12x + 32$

6. $x^2 - 12x + 36$

3. $10x^2 + x - 21$

7. $x^2 + 6x - 16$

4. $2x^2 - 3x - 9$

8. $x^2 - 11x + 30$

Solve the following equations

9. $\frac{y}{2} + 3 = \frac{4y}{5}$

12. $\frac{y}{y+2} + \frac{5}{y-1} = \frac{3}{y+2} + \frac{y}{y-1}$

10. $\frac{3}{4x+2} = \frac{1}{x+2}$

13. $x^2 + 2x - 8 = 0$ by factoring

11. $\frac{x+2}{x+3} - \frac{x+5}{x-3} = \frac{2x-1}{x^2-9}$

14. $3x^2 - 4x - 4 = 0$ by factoring

15. $(x + 2)^2 = 9$

18. $3x^2 + 2x - 8 = 0$ by quadratic formula.

16. $x^2 - 7x - 8 = 0$ by completing the square

19. $x^2 + 5x + 2 = 0$ by quadratic formula

17. $3x^2 - 9x = 33$ by completing the square

20. $2x^2 - 5x - 7 = 0$ by quadratic formula

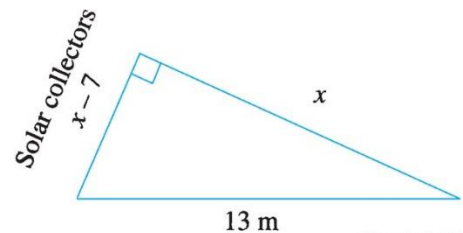
Solve problems (21 – 28). Write your answer as part of a complete sentence with appropriate units and the correct number of significant figures.

21. One computer can process a company's payroll in $1\bar{0}$ hours while a newer computer can do the same job in 6.0 hours. Working together at these rates, how long would it take to complete the payroll?

22. A generator can charge a group of batteries in 18 hours. It begins charging the batteries and 4.0 hours later a second generator starts charging the same set of batteries. If the second generator alone could charge the batteries in 12 h, how long will it take both to charge the batteries?

23. An airplane traveling against the wind travels 500 km in the same time it takes it to travel 650 km with the wind. If the wind speed is 20.0 km/h, find the speed of the airplane in still air.

24. In order to support a solar collector at the correct angle, the roof trusses for a building are designed as right triangles as shown. The rafter on the same side as the solar collector is 7.00 m shorter than the other rafter and the base of each truss is 13.0 m long. What are the lengths of the rafters?



25. In a certain circuit, the power (in watts) is measured using current I (in amperes A), voltage E (in volts V), and resistance, R (in ohms Ω), by $RI^2 + EI = 18000$. If the resistance is 10.0Ω and the voltage is 510 V , find the current in amperes.
26. An open box is to be made from a rectangular piece of aluminum. A 3.00-cm square is to be cut from each corner and the sides will be folded up. If the original piece of aluminum was 1.50 times as long as its width and the volume of the box is 578 cm^3 , what were the dimensions of the original rectangle?
27. In an AC circuit that contains resistance, inductance, and capacitance in series, the applied voltage V can be found by solving $V^2 = V_R^2 + (V_L - V_C)^2$. If $V = 5.8 \text{ V}$, $V_R = 5.0 \text{ V}$, and $V_C = 10 \text{ V}$, find V_L .

A rectangular concrete pipe is constructed with a 10.00 in by 16.00 in interior channel. What uniform width w of concrete must be formed on all sides if the total cross sectional area of the concrete must be 245.0 in^2 ? Round your answer to the correct number of significant figures.

