

Show all necessary steps clearly, neatly, and systematically to receive full credit.

1 - 10 (3 points each) (hint: 20 minutes)

1. Factor completely: $6r^2 + 3rs - 18s^2$.

5. Factor completely: $a^2c + a^2d^2 + bc + bd^2$.

2. Factor completely: $16 - 40z + 25z^2$.

6. Factor completely: $12x^2 - 12$.

3. Factor completely: $6t^4 + 14t^3 - 40t^2$.

7. Solve: $16d^2 - 25 = 0$.

4. Factor completely:
 $5x^3y^3z^4 + 25x^2y^4z^2 - 35x^3y^2z^5$.

8. Simplify: $\frac{-2x^2 + 5x + 3}{x^2 + 2x - 15}$.

9. Solve: $5m^2 = 15m$.

10. Solve: $2x^2 - 3x = 14$.

11 - 15 (4 points each) (hint: 20 minutes)

11. Factor completely: $ab^2 - 4a + 3b^2 - 12$.

13. Factor completely: $r^4s + 216rs^4$.

12. Factor completely: $-x^5 + 128x^2$.

14. Factor completely: $32 - 2t^4$.

15. Perform indicated operation: $\frac{x^2 - x - 6}{2x^2 + 9x + 10} \div \frac{25 - x^2}{2x^2 - 5x + 25}$.

16 - 20 (5 points each) (hint: 30 minutes)

16. Solve: $10b^3 - 15b^2 = 25b$.

17. Perform indicated operation:

$$\frac{5}{x^2 - 9x + 8} - \frac{3}{16 + 6x - x^2}$$

18. Solve: $(2s + 5)(s + 1) = -1$.

19. All cars have a blind spot where it is difficult for the driver to see a car behind and to the right. The area of the rectangular blind spot is 54 ft^2 . Its length is 3 feet longer than its width. Find its dimensions. (3-steps format)

20. The inclined ramp of the boat launch is 8 meters longer than the rise of the ramp. The run is 7 meters longer than the rise. How long are the three sides of the ramp? (3-steps format)

